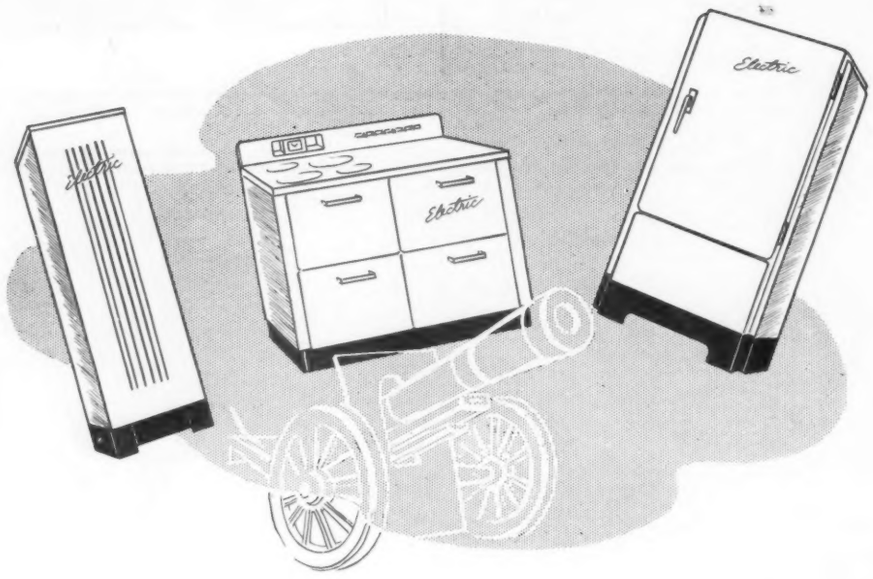
ELECTRICAL WEST

RAW-HILL CO. OF CALIF. **AUGUST 1936** PRICE 25c PER COPY

Clyde Sunderland Photo

COMMEMORATIVE of the completion of the two great bridges, San Francisco's Golden Gate International Exposition will virtually rise from the Bay. To the left of Yerba Buena Island in the center background may be seen the initial work of the dredges. Electrically this Pagaent of the Pacific promises to set new records — in lighting and in the scope of the exhibits. This birdseye view shows both bridges, San Francisco, Oakland, Berkeley and the Marin shore.



LET'S BRING UP THE

HEAVY ARTILLERY

For years we in the electrical industry have been plugging away at appliance sales. We have sold millions of waffle irons, vacuum cleaners and a dozen other devices. We have equipped one home in every three with an electric refrigerator . . . admittedly a magnificent job.

But still we are far from realizing our possibilities. We have yet to bring our heavy artillery into play.

The biggest sales opportunity for the electrical dealer lies in the All-Electric Kitchen. Here is a dramatic idea . . . opening up a field for more business and bigger profits than ever before.

Consumer acceptance of electric ranges is established. Water heater sales are well started. Every woman who owns an electric refrigerator is a prospect for an All-Electric Kitchen. Her ears are open to the story of this greatest improvement for modern homes.

So let's bring up the heavy artillery. Let's talk the All-Electric Kitchen . . . what it means in terms of comfort, convenience and economy . . . how it contributes to a more abundant life. Once this idea is finally planted, appliance sales will take care of themselves.

SOUTHERN CALIFORNIA EDISON COMPANY LTD.

Edison

CALIFORNIA'S *Electrical Age* HAS JUST BEGUN!

8-36

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ELECTRICAL WEST

With which are consolidated the "Electrical Journal," the "Journal of Electricity, Power and Gas," and the "Journal of Electricity."

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▼

• THE KAISER, back in 1912, convened a conference in Berlin, where what constitutes a bona fide world fair was set down in definite style. Forthcoming in San Francisco Bay is an exposition which seems to qualify. Charles Huyck of Graybar submits proof of the above, and also drives home the importance of this world fair to the electrical industry. His first account of the "Golden Gate International Exposition" begins on page 15.

●

• PIGS AND TURKEYS usually come into the world without fanfare. No one has bothered to spoil them with comforts. But now, many farmers are beginning to realize that a pig in the sty is worth ten in the grave, and are finding it profitable to employ electric brooders to keep these pigs and turkeys from dying in their babyhood. Brooders are described in the Rural Load Building section.

●

• SHOCK COUNTERSHOCK is a formula for saving life! Painstaking research with animals, in order to determine accurately, in quantitative terms, the effect of electric shock upon humans has been reported in an A.I.E.E. paper which is reviewed in the Engineering Symposium.

• SUBSTATION LOADING, and the problem of shifting loads from one substation to another is discussed by H. H. Minor in his third and last paper on distribution planning, which opens the engineering section. To central offices of the California Department of Public Works are sent bi-hourly reports of the water level in important Sierra streams. But often no human goes near these isolated stream gaging sations for months! They are completely automatic, and they report by radio. This system is also described in the Engineering Symposium.

●

NEXT MONTH

• TIMED to the Fall and Winter selling season will be the second Annual Appliance Sales Guide in the September issue. Loaded to the brim with concentrated selling ideas, sales resistance busters, selling appeals on all types of electrical appliances, every dealer, salesman and indeed everyone who earns his living in the industry will be able to see that the public buys electrically this Fall. Easy reading and pictorial these ideas will be ready for immediate use in preparing advertising or window displays, talking to a prospect and closing the sale. (In fact, place orders now for extra copies since this selling manual will go like hotcakes among those who want to earn sizeable Christmas commissions and bonuses.)

TEST SWITCHES

FOR

TESTING
CALIBRATING
DISCONNECTING
» METERS
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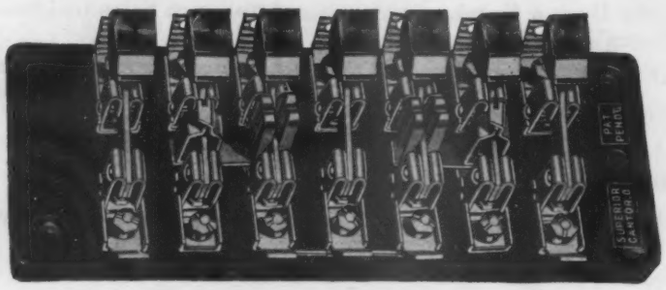

Cat. No. 1007F Superior Test Switch
For 3 phase, 3 wire meters

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Letters...

More Utility, Less Spectacle For Better Display Kitchens*

To the Editor:

Sir—In reference to the "Wife-Saving Electric Kitchen", pictured in the March issue of ELECTRICAL WEST, and also to the variations of such displays that I have seen, most such displays seem to have many errors in lay-out, which will cause unnecessary work and inconvenience for the housewife. Surely any attempt to sell an all-electric kitchen on a labor saving basis, should be backed up by a display that is really labor saving and practical, rather than by one which is merely superficially labor saving, and in reality has many inconvenient features which can be seen by any woman accustomed to kitchen work.

For example, in the kitchen shown, the refrigerator is on the left hand side of the kitchen, and the refrigerator door is hinged on the right. Thus, every time the housewife goes to the refrigerator she has to walk around the door, taking scores of extra steps during a day. On the right hand side of the kitchen, the refrigerator door would open away from the housewife, saving steps and time.

Since, even with electric cooking, frying foods spatter some grease, and since, in spite of all advertising, foods being cooked on the surface elements still radiate heat, why place the stove so that these elements are adjacent to part of the housewife's working surface? If she is working on the right hand side of the sink, the grease and heat will be annoying. If the refrigerator were moved to the right, it would be only logical to move the range to the left, where the elements would be away from the working surface adjacent to the sink.

Also, a vent should be provided over the stove. This should be fitted with a fan, so that heat and odors could be drawn directly from the range, rather than allowing a window appliance or such, to circulate heat and fumes through the whole kitchen before expelling them.

For the use of small stores and the smaller district offices of utilities, where it is not economically feasible to have an actual electric kitchen on display, why would it not be a good idea to have a small scale model? Such a model could be made adjustable, so that the prospect could be shown just how the equipment would fit into her own home.

Other bad things to have in displays stressing labor saving features are upper cupboards. These are useless except for storage of seldom used articles. No average woman can reach them without using a stool, chair, or stepladder. Details like cupboards and drawers should be made easily accessible. Thought should make the whole kitchen a labor saving tool. The photograph shows a number of appliances on each side of the sink, but no convenient place to store them when not in use. While it is o. k. to have these appliances on display for an all-electric kitchen, the housewife does not want them on display, accumulating dirt and dust, when she gets them home. She wants a place where she can store them and reach them without standing on a stepladder or kneeling on the floor.

J. H. H.

*While the writer's arguments are constructive and pertinent to the actual or model kitchen, display kitchens have limitations. They usually must be arranged for complete inspection from a single direction. This limits layout to one, two or at most three walls, a situation which is further complicated by the effort to secure an arrangement which can be effectively reproduced within the two dimensions of the printed page.

Maintenance of
R.L.M.★ *Efficiency*

is your second responsibility to the user of Electrical Illumination

★ RLM stands for certain high standards of illuminating efficiency which are certified by the Electrical Testing Laboratories of New York. All products bearing this label to be met by

To see that the purchaser of electrical illumination secures the RIGHT LIGHTING through the installation of reflectors bearing the R.L.M. label is your first responsibility.

To educate the purchaser to the fact that dirty lamps and reflectors can waste from 20% to 80% of their R.L.M. efficiency; to provide reflectors of a type which will encourage the adherence to a periodic cleaning and inspection schedule; is your second responsibility.

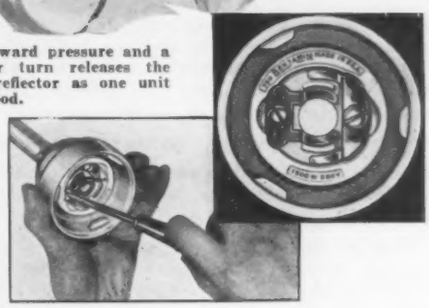
Both obligations are fulfilled when you install Benjamin Reflectors with the exclusive TURNLOX feature.

TURNLOX encourages frequent reflector cleaning because it *reduces* maintenance costs and *simplifies* cleaning and inspection.

TURNLOX makes it possible to remove, instantly, in one unit, both the lamp and reflector from the hood . . . no time is wasted . . . no pails or cleaning rags need be taken up a ladder . . . the reflectors can be cleaned on the floor or at the bench and put up again in a fraction of the time required with other "fixed" types . . . or, with a few "spare" reflectors, replacements with previously cleaned reflectors can be made without a minute's interruption of plant operations.

If you haven't complete data on all types of Benjamin TURNLOX Reflectors, mail the coupon below.

A slight upward pressure and a one quarter turn releases the lamp and reflector as one unit from the hood.



Get the Data on these and the other Benjamin "TURNLOX" Reflectors.

BENJAMIN TRADE MARK **TURNLOX**

Lighting Reflectors

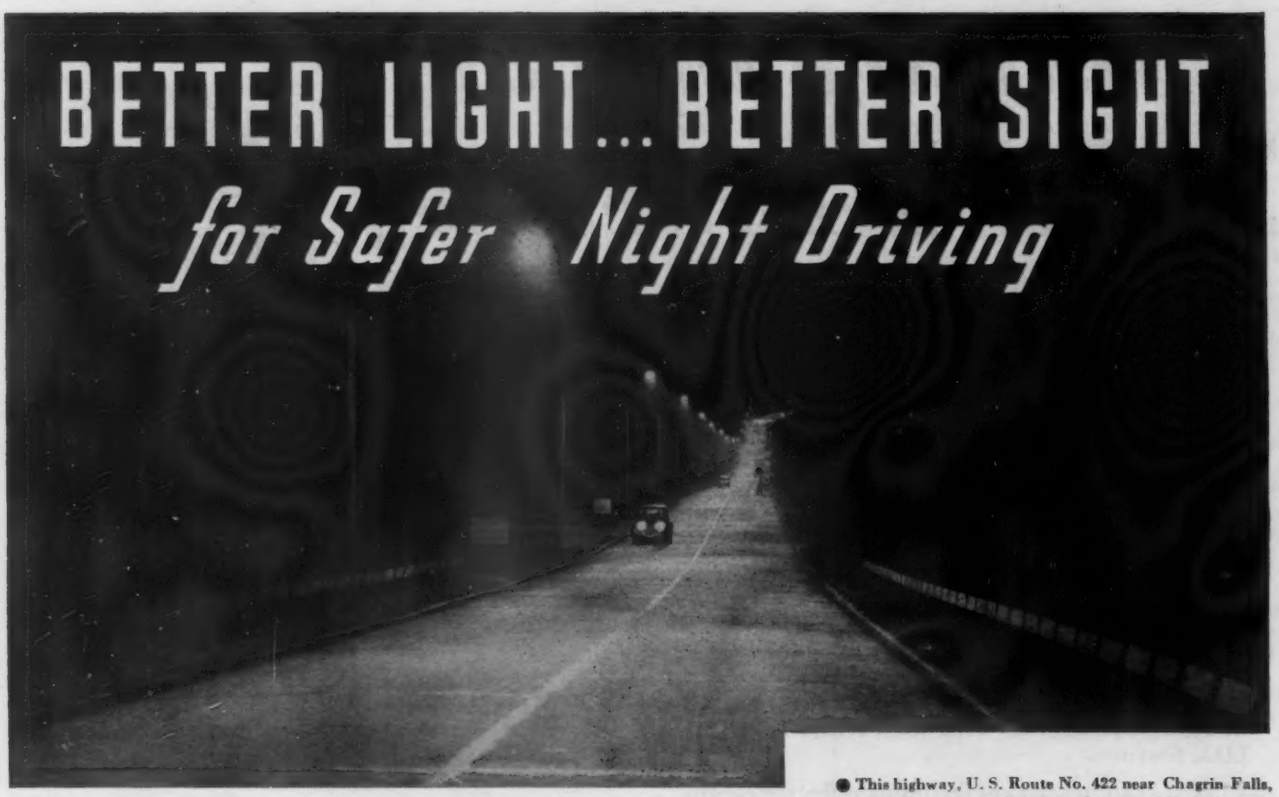
BENJAMIN ELECTRIC MFG. CO. Des Plaines, Ill., Chicago, New York, San Francisco

Benjamin Electric Mfg. Co., Dept. E. W., San Francisco, California.

Send me Benjamin catalog containing complete information on Turnlox and R.L.M. efficiency standards.

PRINT NAME AND ADDRESS IN MARGIN BELOW

BETTER LIGHT... BETTER SIGHT
for Safer Night Driving



● This highway, U. S. Route No. 422 near Chagrin Falls, 15 miles from Cleveland, is lighted for one mile with newly developed safety lighting. The lighting consists of forty reflectors of a basically new design, equipped with 4000-lumen incandescent lamps. The units are mounted 25 feet high, 125 feet apart, and extend 5 feet out over the pavement. The photograph below shows a daytime view of the same stretch of highway.

New G-E high-visibility lighting system provides high visibility on highways at night

General Electric's new high-visibility lighting system for highways, recently developed by the Nela Park Engineering Department, is an especially timely means for effecting a major reduction in the mounting toll of highway accidents. *One-third of all traffic fatalities occur on rural highways after dark.* Because of the great improvement in seeing provided by the newest developments in highway lighting, it is conservatively estimated that fully one half of highway accidents at night would be prevented by safety lighting. The gain in safety achieved under this new system is evident from the fact that the seeing it provides could be equalled under some of the past inefficient systems only with four to five times as much total light.

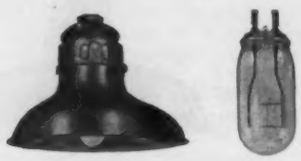
The new highway-lighting system has three outstanding features:

1. Proportion of light reaching pavement and shoulders is nearly doubled as compared with some of the former equipments.
2. Glare is suppressed by completely shielding the light sources to approximately 10 degrees below the horizontal, largely obviating the interference with seeing, which in many of the former systems has wasted as much as one half of the "seeing light."
3. The road surface presents an altogether higher uniformity of brightness, free from areas of low visibility.

In short, a driver sees more quickly and surely; headlights are much less glaring; there is less strain on the driver and greater safety for pedestrians because of the higher visibility afforded.

To utilities, the new General Electric safety lighting system for highways helps to open a market long dormant.

For more detailed information consult your nearest General Electric office, or G-E Lamp Sales Dept., or write to General Electric Company, Dept. 166, Nela Park, Cleveland, Ohio.



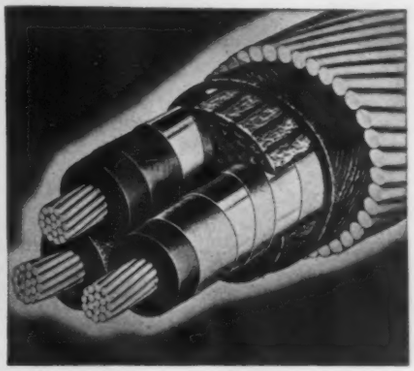
● The photograph to the left shows one of the new Novalux highway Luminaires made of electrolytically-processed aluminum. The other photograph shows one of the new 4000-lumen, 6.6-ampere MAZDA lamps for use in this equipment. This lamp is compact, accurate, prefocused, and being made of hard glass is free from the danger of water breakage.

GENERAL ELECTRIC

MAZDA LAMPS

Another Achievement

for Rubber Insulation



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THE CABLE:

Three conductor # 4/0 Amarine Insulated non-leaded, jute and # 4 BWG Armor 3.9" O. D. weight 14.5 lbs. per foot

THE OPERATION:

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Pacific Coast Distributors of Electrical Wires and Cables for American Steel & Wire Company

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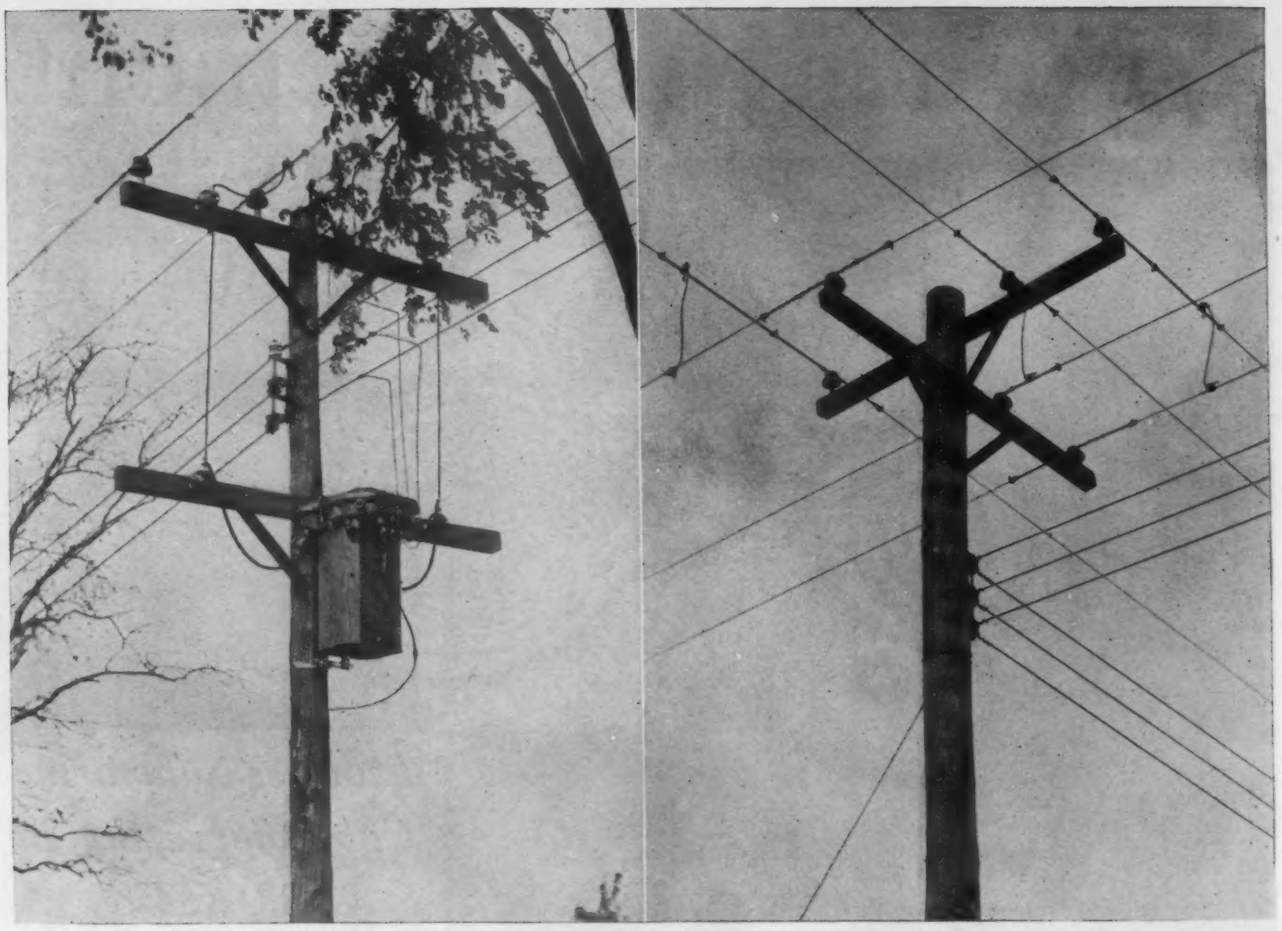

EIGHT STRAND A·C·S·R

LOWER COST • • GREATER RELIABILITY

The crux of the rural problem is the cost of erecting good lines. 8-strand A. C. S. R. bites into this cost.

Twenty-five per cent greater strength permits longer spans, with fewer poles and fewer fittings. Stresses are kept within limits which experience has shown to be reasonable and safe. Fittings are interchangeable with 7-strand. Obviously costs go down. But neither service reliability nor permanence are neglected.

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For further protection against arcs and reinforcement against vibration-fatigue and abrasion, Armor Rods have been developed by our engineers. They are a part of A. C. S. R. service available to you, and we are also glad to give cooperation on all technical problems of erecting rural lines. Write for information. ALUMINUM COMPANY OF AMERICA, 2132 Gulf Building, Pittsburgh, Pennsylvania.

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NEW, SIMPLIFIED, AUTOMATIC GENERATOR-VOLTAGE REGULATORS

No dashpot

No vibrating contacts

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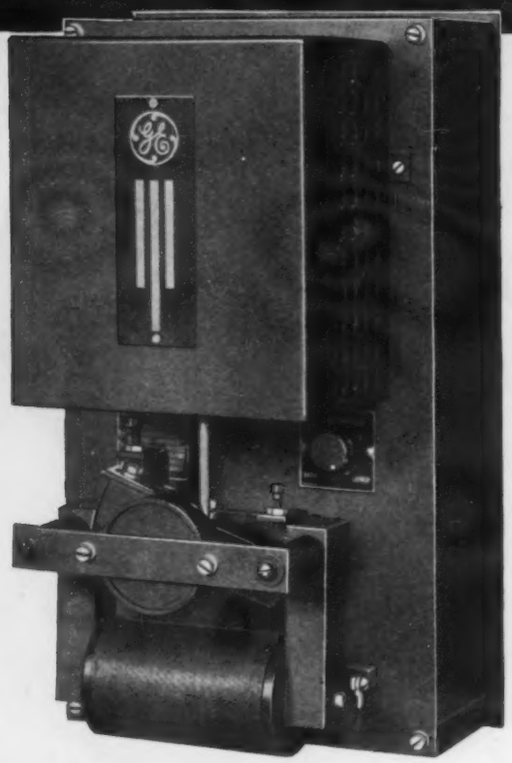

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Inherently smooth

Five different sizes

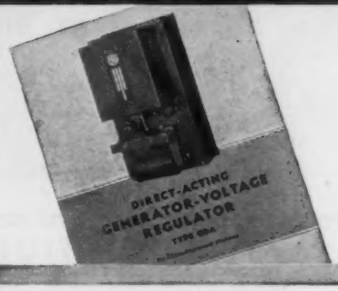
. . . . to give you constant and dependable voltage.

NOW you can obtain the new G-E simplified (Type GDA) regulator for controlling the voltage of a-c and d-c generators and of synchronous motors and condensers. There are five different sizes, suitable for small and medium-sized machines.

Type GDA regulators are easy to install, with only six leads to connect, and they can be mounted on a switchboard panel or on a supporting bracket. We invite you to make inquiry as to the savings in maintenance and improved operation that you can obtain. Get in touch with your nearest G-E office or write to Schenectady, N. Y., using the coupon below.

GENERAL ELECTRIC

NEW BOOKLET GIVES COMPLETE STORY



General Electric, Dept. 6D—201, Schenectady, N. Y.

Gentlemen: Please send me a copy of your new booklet, GEA-2022A.

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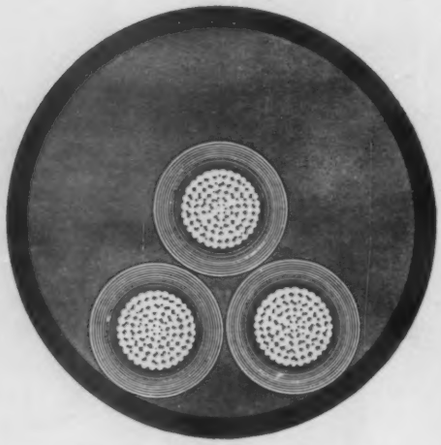
(Reg. U. S. Pat. Off.)

TRANSMISSION SYSTEM

The way to Big Savings in Construction and Maintenance



Power transmission by Pipe Line!

OILOSTATIC is not offered as a general substitute for the usual type of conduit construction in which distribution and transmission circuits are carried beneath busy city streets. Rather, it is offered as a reliable, rugged and flexible underground cable construction capable of effecting large savings in appropriate applications.

In open country and for many routes approaching heavy load centers it can often *compete with overhead line construction.* It is particularly applicable where overhead construction would involve high right-of-way costs and where there are physical conditions adverse to towers or pole lines.

OILOSTATIC will solve perplexing problems that may arise in connection with electrification projects, tunnels, bridges, railroad embankments, highways, airports, parks and golf courses; or in crossing swamps, rivers, lakes and bays.

Distinctive features of OILOSTATIC:

NO DUCTS. NO LEAD SHEATH. NO VOIDS IN THE INSULATION. HIGHER DIELECTRIC STRENGTH. GREATER INSULATION STABILITY. INCREASED CURRENT CARRYING CAPACITY. NO PRACTICAL VOLTAGE LIMITS.

Two OILOSTATIC installations, one at 132 kv. and one at 66 kv. are already in successful operation.

Our engineering services are always available. Inquiries on specific projects are invited.

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announces the

MULTI-BREAKER LOAD CENTER

● **Now—for the first time—you can offer circuit breaker protection for the home at a low cost—a price comparable to that of a good range switch and fuses!**

The Multi-breakeR is small and attractive—can be installed in any wall of a home. It provides switching in each branch circuit.

To your customers, the Multi-breakeR means complete protection and a reduction in service interruptions; the elimination of the trouble and repeated expense of obtaining, storing and changing fuses.

To you, the Multi-breakeR offers the opportunity of introducing a much needed electrical convenience—one that will bring you immediate sales at a good profit.

Be the first in your community to install the new Multi-breakeR Load Center. It's ideal for electric range installations. Talk to your power company as well as your customers. But, above all, see the Multi-breakeR at your Square D distributor's showroom.

Bulletin CA-541 fully describes the Multi-breakeR.

CALL IN A SQUARE D **SQUARE D MAN**

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DETROIT - MILWAUKEE - LOS ANGELES

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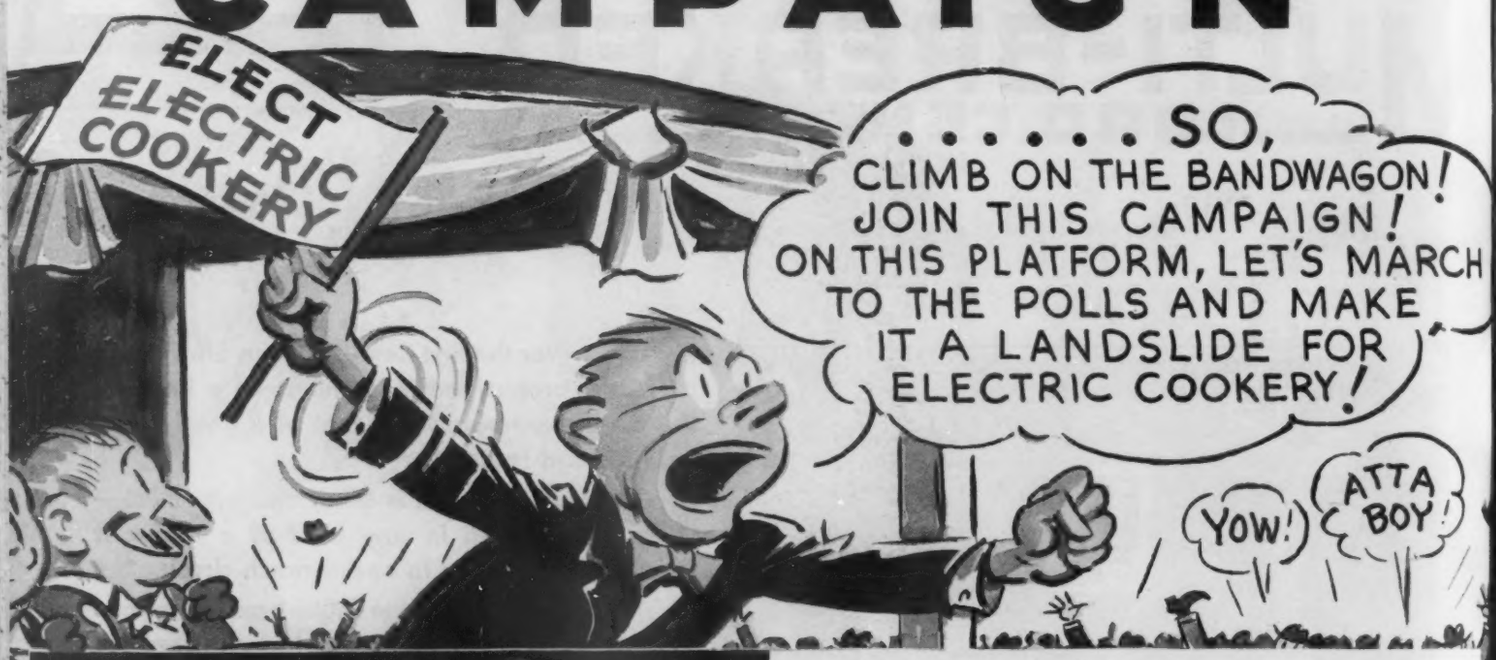
ELECTION CAMPAIGN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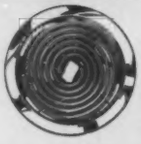
. . . . . SO, CLIMB ON THE BANDWAGON! JOIN THIS CAMPAIGN! ON THIS PLATFORM, LET'S MARCH TO THE POLLS AND MAKE IT A LANDSLIDE FOR ELECTRIC COOKERY!
YOW!
ATTA BOY!

The NEW CAMBRIDGE
Hotpoint's new style winner in full porcelain enamel with chromium trim, 3 Calrod units and Thrift Cooker.



HOTPOINT HI-SPEED CALROD
SEALED IN INCONEL
—the nickel chromium alloy that withstands the same heat as the inner resistance wire. Calrod's speed, long life and freedom from service complaint are "making" electric cookery.

WE'RE out to elect electric cookery. The Poll of Public Preference shows the electric range far in the lead. Join this campaign for a Grand Old Percentage of sales results!

The Election Campaign is Hotpoint's new program for Fall Sales activity. It is keyed to the spirit of the times. It offers you completely organized plans, new direct mail material, salesmen's contest, newspaper advertising and window displays, all built around the "election" theme.

Ask the Hotpoint representative in your district to show you The Election Campaign Plan Book. Study it carefully. Let it help you win more votes for electric cookery in your territory.

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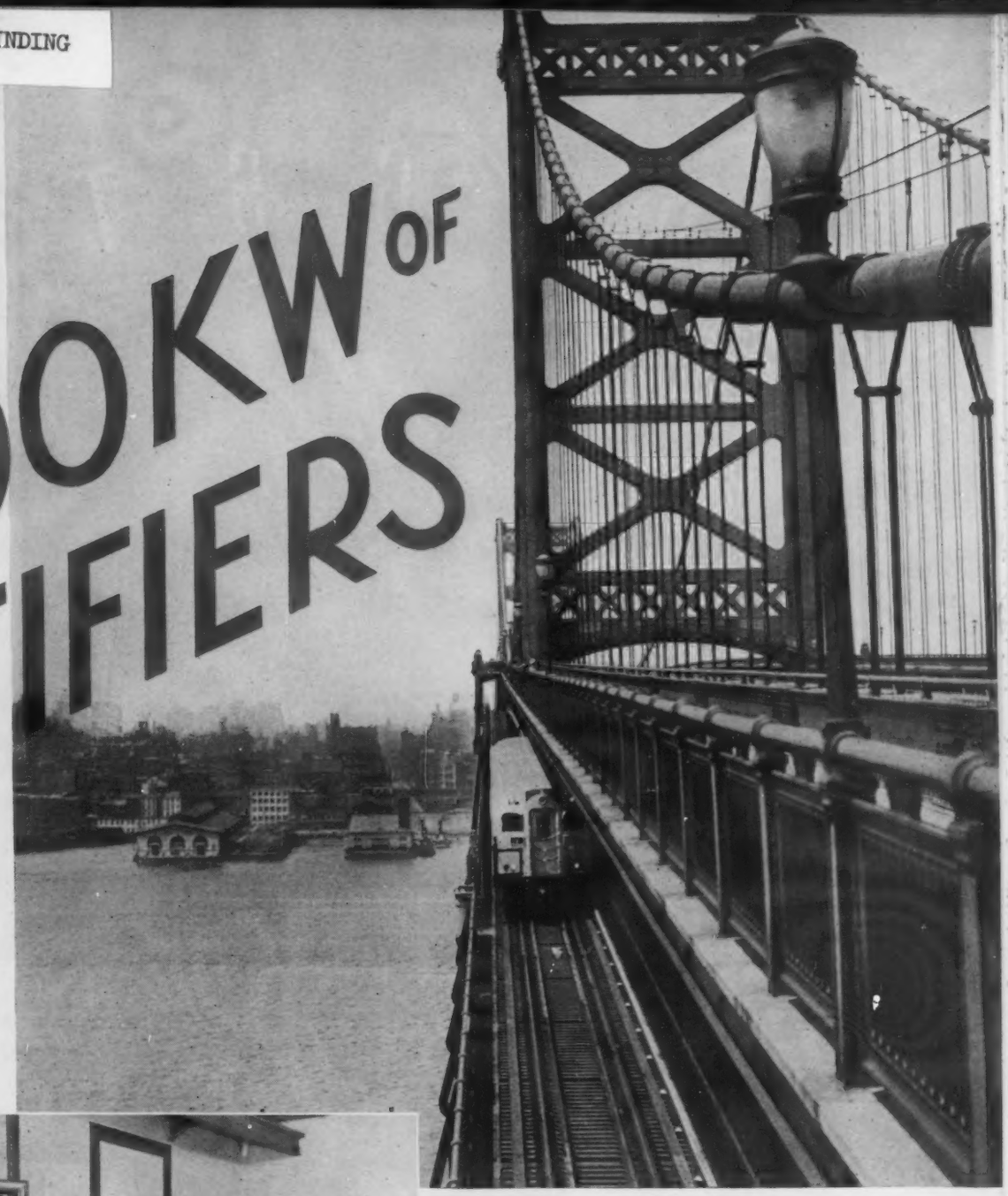
5612 West Taylor Street, Chicago, Ill.

ELECTRIC *Hotpoint* RANGES

WATER HEATERS

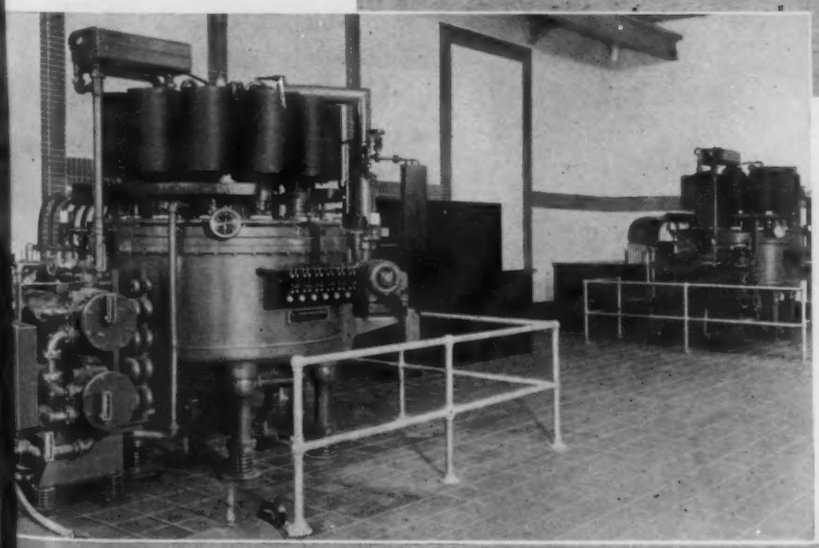
PRINT IN BINDING

8000 KW OF RECTIFIERS



(*Right*) View of New High Speed Transit Line on Delaware River Bridge.

(*Below*) Interior View of substation on Camden side of bridge showing two of four 2000kw, 630volt Allis-Chalmers Mercury Arc Rectifiers.



TRAINS run swiftly, smoothly over this Delaware River Bridge new high speed transit line that forms an important connecting link between Philadelphia and Camden.

And to assure uninterrupted service, all equipment that has a part in supplying d-c power to that line is Allis-Chalmers —8000 kw of Mercury Arc Rectifiers, 12,500 kva of Transformers, 26 Armorclad Switchgear Units.

ELECTRICAL DIVISION

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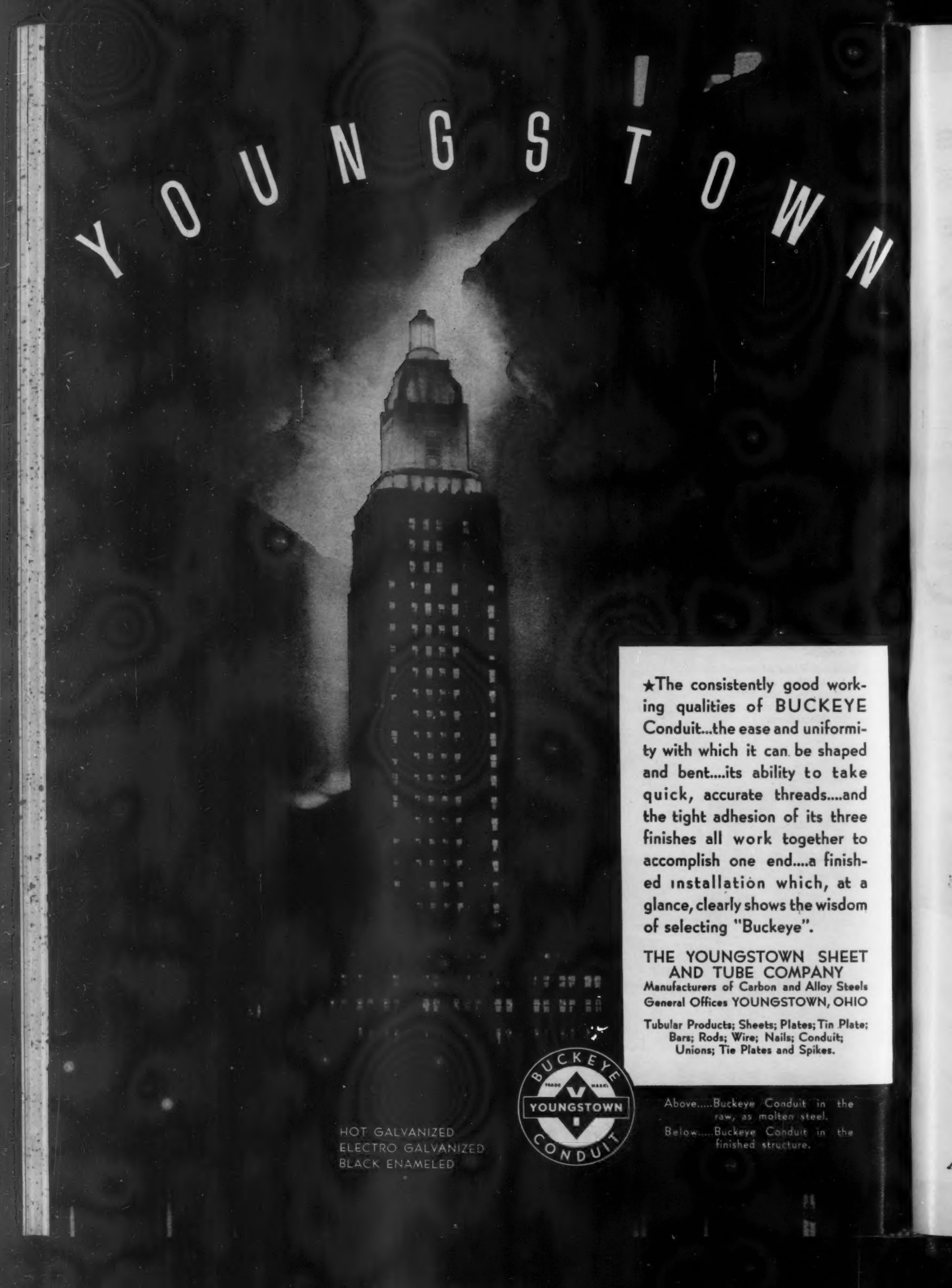

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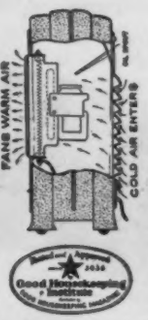

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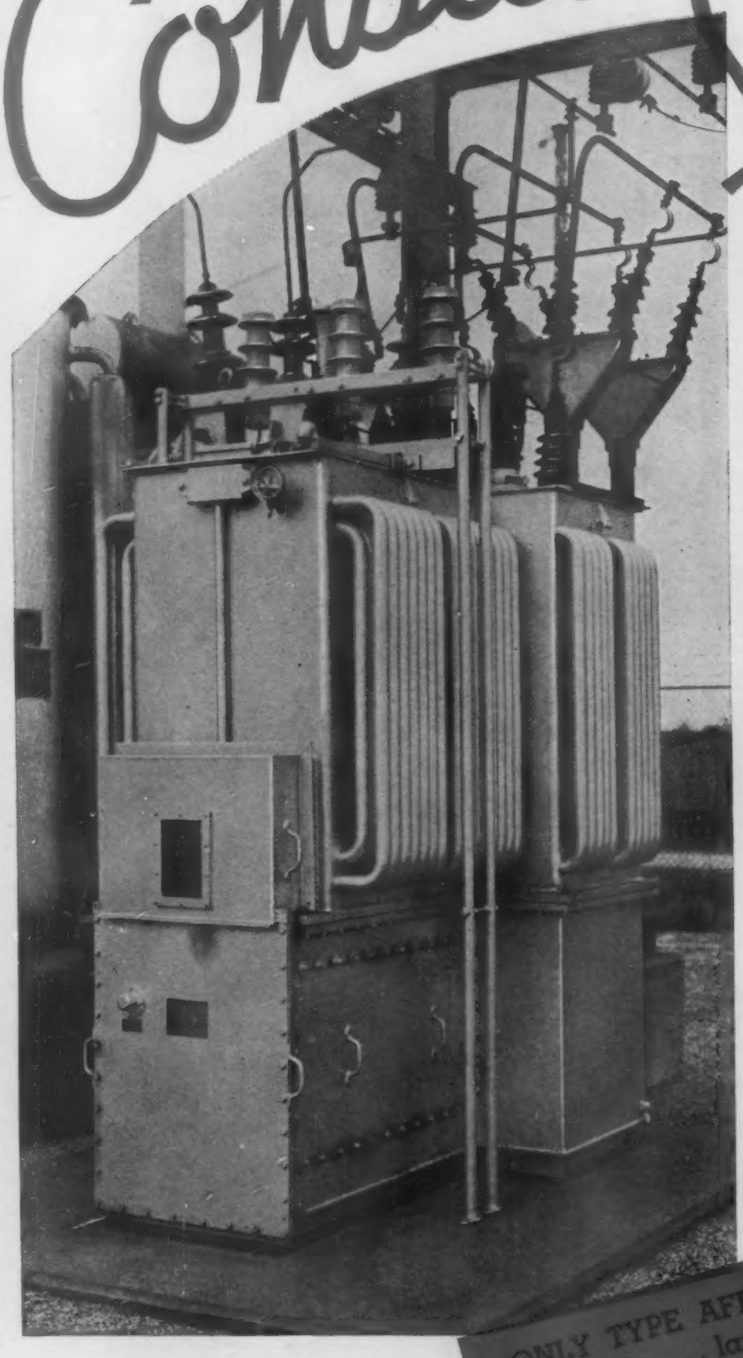

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ELECTRICAL WEST

[*Devoted to the economic production, transmission and distribution of electric power and its application to industry, commerce and the home in the Pacific Empire, and to the sale and distribution of electrical utilization devices, equipment and appliances in that area*]

August, 1936

The Golden Gate International Exposition

A Preview and Some Comparisons

By CHARLES L. HUYCK
Graybar Electric Co., Inc., San Francisco

AMERICANS are adaptable, Westerners are particularly so. Living in a wonderland, they are accustomed to marvels, even an approaching World's Fair. And therefore current comment, in the street or on the Street, runs something like this:

"I see we're going to have an Exposition."

"That's so. Wonder how they're getting along with it?"

Well, as a matter of fact, "They" are getting along very well with it, thank you. The site has been chosen, a man-made island nestling under the lee of Yerba Buena Island in San Francisco Bay; ferry slips are being built, an administration building is almost ready for occupancy, government support and financial aid has been secured, plants are being propagated, and a battalion of architects and engineers are blueprinting their dreams. In a month or so bidders will be busy, soon after that the awards will be made, and early in 1937 the Exposition will be mounting into the skyline as subtly as did the bridges which prompted it, and will become as familiar to sight-seer and commuter. Another instance of adaptability!

What are the essential qualifications of a World's Fair such as we are projecting? In 1912, the Kaiser convened an international congress in Berlin to determine this very point, and it was there decided that an exposition is truly universal "when opened to every possible expression of human effort" and official "when directly originated by a government or under government patronage." It is also evident that it must celebrate some historic event or immediate achievement of international significance, just as Chicago commemorated in 1893 (a little late) the Four Hundredth Anniversary of the landing of Columbus, and San Francisco in 1915 the opening of the Panama Canal. It must be participated in by other nations than its originator, thereby differing from Philadelphia's Sesquicentennial in 1927. It must cover a wide range of national products, thereby differing from the trade fairs so successfully staged among the mediaeval settings of German cities. It should be supported by a large adjacent population who are actual beneficiaries from the occasion it celebrates. And of course it must be on a grand scale.

Let us see how the Golden Gate International Exposition meets these objectives in their order. First, its scope is decidedly international, having been officially defined as "modern transportation and communication, symbolized by the bridges, and by radio and television progress," and by the fact that the grounds will later become San Francisco's own airport. All this is certainly "world-wide"; it seems to anticipate Rudyard Kipling's prophecy of our planet under direction of an Aerial Board of Control.

Second, about 25 per cent of its estimated cost is provided by WPA and PWA grants, thus qualifying it as official; furthermore, a joint Congressional Bill was signed by the President on June 17, authorizing him to invite foreign participation.

Third, the immediate spark is the completion of the San Francisco-Oakland ($72,000,000) and the Golden Gate ($30,000,000) Bridges over a world-renowned harbor, and most ships or their sisters of the Seven Seas are familiar with that harbor.

Fourth, while all the world will be invited, an especial effort will be made to attract nations bordering the Pacific Ocean, because that will be the wider stage for the next act in civilization's mighty drama, supplanting the Mediterranean and the Atlantic in their turn. And as for being on a grand scale, its estimated cost of $25,000,000 puts it on a par with the magnificent Panama-Pacific International Exposition, still considered the paragon of all world's fairs.

Some interesting records have been hung up by past expositions. Paris holds a double palm for attendance (or a medal and a citation as the legionaires would say) attracting 39 million spectators in 1900, and 32 million in 1889 when the Eiffel Tower was a potent magnet.

London's British Empire Exhibition drew 27 million during two years, 1924-25; Chicago, 22 million in 1893 and again in 1933. San Francisco's 1915 Exposition ranks sixth with 18¾ million, a remarkable showing when compared with the huge adjacent populations of Paris, London, and Chicago; we had perhaps two million people in a two hundred mile radius, whereas these mighty rivals had perhaps five times as many in one-tenth that radius.

As to cost, Chicago 1893 is tops with

Foreshadowing February 18, 1939, opening day of the Golden Gate International Exposition, is this fast growing dot of land on shoals north of Yerba Buena Island. Larger than the Chicago fair site, this one will include 16,000 feet of seawall, protecting 19,000,000 cu. yd. of sand, being pumped under supervision of U. S. Army Engineers

$30,000,000; San Francisco 1915 second with $26,000,000; and Paris 1900 third with $23,000,000.

St. Louis 1904 is first for receipts, unofficially claiming $46,000,000; San Francisco second with $27,000,000; Paris 1900 third with $23,000,000.

St. Louis is also first for space, having covered 1,240 acres; San Francisco second with 635; Paris 1900 third with 549; whereas the vast crowds of Chicago and London were intensified by their small areas of only 200 acres. Still, weary feet is a habitual disease of sight-seers, and wise exhibitors calibrate their exhibits to register on brains numbed by bodily fatigue.

The G. G. I. E. will bequeath its site and larger buildings to San Francisco's airport, just as every other great exposition has made a permanent contribution to its progenitors and public. This may be tangible, such as the Crystal Palace from the mother of all such affairs, held in London in 1851 and dedicated to Universal Peace—with the ironical aftermath that, within twenty years, the Crimean, American Civil, and Franco-Prussian wars had been fought. San Francisco's Civic Auditorium was built by the P. P. I. E., and it has led to many battles too, though happily merely political or pugilistic.

Or the heritage may be in even more valuable intangibles, such as the imperial cement mixed by London's British Empire Exhibition and its comprehensive demonstration of Imperial resources and unity; or the modernistic tinge given the industrial products and designs of every civilized nation by Paris in 1925, which was directly responsible for world-wide acceptance of the authentic moderne note. The United States, by the way, was represented there only by Secretary of Commerce Hoover's commissioners, who ventured timidly into that bizarre setting much as the Trojans approached the Wooden Horse ("fearing the Greeks when offering such gifts"), and pitched in such a smashing report of its excellence as to produce complete submission by American designers and manufacturers.

The site of the 1939 Exposition represents an interesting evolution in San Francisco's own estimate of itself. That city's old Midwinter Fair in 1894 was built in Golden Gate Park because that was then the city's proudest achievement, recently wrested from sand dunes and far surpassing its contemporaries. The harbor and its daily procession of tall clippers and stubby steamers was rather taken for granted.

Twenty-one years later, however, it proudly planted its Panama Exposition right alongside the Bay as a rightful terminus of the Panama Canal, and manicured the harbor view. mudflats with clamshell buckets to make the present Marina. Who can forget the first glimpse of it, that rain-washed opening day, when the crowd flowed over the surrounding amphitheatre of hills and saw, beside a bay as colorless as watered silk, the palaces and domes of that glorious vision?

And now, twenty-one years later, mud is again being pumped to make solid ground, only this time the site is plumb out in the middle of the bay, symbolizing the bridges and their linking of a Greater San Francisco.

Perhaps you recall a photograph or so in last February's papers showing several officials and the inevitable girl (clad chiefly in a glow of health) without whom no inauguration picture of anything would be orthodox. They were precariously balanced on rocks and sandspits and were officially opening the Golden Gate International Exposition of 1939. Thus simply and quietly are such enterprises begun, for on that day two United States Army dredges (the work being under Army Engineers' supervision), began their fourteen months' job of reclaiming the site on strictly fundamentalist or Book of Genesis principles: "Let the dry land appear!" So about April 1937 you will see, instead of gray-green water and sandy ooze, a new island, nuzzling alongside Yerba Buena like a pup seal beside its mother, more than a mile long and two-thirds of a mile wide—5,500 by 3,420 feet to be exact—protected by a three-mile seawall and bulkhead. This is the Exposition site, 430 acres in extent as compared with the 635 acres of 1915 and just about the size of Chicago's Century of Progress.

The G. G. I. E. will cost $25,000,000, of which $6,250,000 will be provided by WPA and PWA grants, $7,500,000 through private subscription (four millions in forty minutes was the P. P. I. E.'s record!), and $11,250,000 by admission, exhibition, and concession fees. The Federal grants of $6,250,000 may be itemized as approximately $3,045,000 WPA for seawall and fill; $1,310,000 WPA for roadways, causeway, trestles, landscaping, and drainage; and $1,895,000 PWA for paving, ferry slips, and certain buildings.

Remember that, after the Exposition has been wrecked, its site becomes San Francisco's airport and that some structures must therefore be convertible for their permanent purpose. This will necessarily influence the design. It is probable that the court layout, an architectural innovation of 1915, will be followed again to capture sunlight in high-walled courts and to shield evening crowds from Pacific breezes.

Five major exhibit palaces to cost $1,400,000 are planned and one of them will undoubtedly be devoted exclusively to electricity, the prime mover and civilizing agent of our times. Two hangars and an air terminal, all permanent, will aggregate as much more; ferry terminals and pier will total $732,200. The administration building at Bush and Stockton Streets cost $150,000.

Mention has been made of San Francisco's Midwinter Fair of 1894. That it was held at all was largely due to

the initiative and energy of M. H. de Young, proprietor of *The Chronicle*, who negotiated with prominent exhibitors and concessionaires of the Chicago Columbian Exposition, and persuaded them to set up their wares two thousand miles farther west after the larger show closed. This cashing in on Columbian success is reminiscent of Amerigo Vespucci four hundred years earlier, for he, being a pal of Behaim, the globe-maker, is responsible for our classification as Americans rather than Columbians.

The name and duration of this Midwinter Fair is as interesting a phase of San Francisco's evolution as its location, it having been opened on January 1 to tell the world that its winters are warm. Nowadays a truer sense of salesmanship extols the city's cool summers! It cost $1,200,000 and attracted 2¼ million visitors.

Contrast the 2¼ million visitors of 1894 with the 18¾ million of 1915. Since then London drew 27 million in two years of 1924-25, and Chicago 39 million in 1933-34. It seems reasonable to assume that close to 20 million will visit San Francisco in 1939, and that their patronage, coupled with Federal grants and private subscription, will meet all expenses and show a little profit. Remember that the 1915 Fair made an actual return on investment of about five per cent as compared with Chicago's loss of fifty per cent in 1893, and London's red figure of thirty-six per cent in 1924-25. Remember also that the incalculable intangible benefit from such cosmopolitan mingling is comparable to the exchange of ideas produced by the Crusades. For example, Chicago's influence in 1893 replaced jig-saw architecture with two decades of classical structures; San Francisco, and still more San Diego, in 1915-16, popularized the Mediterranean villa or bungalow, culminating in a Florida boom which rocked Hollywood to its celluloid foundations; Paris in 1925 reincarnated Yucatan and Babylonia and notched our skyline with step-pyramid skyscrapers. The influence of a great exposition is radioactive for a generation.

The electrical industry is jubilant over an unparalleled opportunity to show the world how the products of electricity, like electricity itself, virtually permeate our planet. Beloved "Bill" Berry used to tell of his experiences at Chicago in 1893 when in charge of Thomson-Houston's exhibit, the star feature of which was a column encrusted with bulbs controlled by a flasher; and crowds gaped by the hour at a display which any modern kid would disparage. The *chef d'oeuvre* of 1893 would be a mere *hors d'oeuvre* today.

At Buffalo in 1901 and at St. Louis in 1904, outline lighting was used lavishly along every cornice; it remained for San Francisco in 1915 to invent a new technique under the great D'Arcy Ryan, whose battery of beacons miraculously washed the walls with light and seemed to sprinkle the Tower of Jewels with gems. The electrical worker deserved a niche on that very tower where all could see him as he appeared during the last strenuous weeks preceding the opening: in heroic bronze, say, his hands full of lamps, coils of wire slung about his shoulders, and his frame outlined in his favorite cleat receptacles. But the electrical pace has accelerated tremendously since then; it crawled in 1893, walked in 1904, ran in 1915, and leaps so prodigiously nowadays that 1939 is unpredictable electrically—let us hope television won't replace the season ticket!

So far our story has dealt with such major initial problems as purpose, site, financing, Government recognition, general layout, and a comparison with similar fairs of the past. Such details as executive personnel, architecture, art, color, planting, nomenclature of main exhibit palaces, character of exhibits, awards, spectacular features, concessions, and especially our electrical participation, will be covered by subsequent issues, because we believe that all branches of our industry are vitally interested in them.

Electricity in both its workaday and holiday aspects will play a supreme part in the success of the Golden Gate International Exposition—more so than in any other affair of its kind ever attempted anywhere.

•

"Cooperation"—Choose Your Brand

"Sparks—the voice of The Electric Club, Los Angeles, offers a thought on that much used, and much abused, word "co-operation" that seems to ring the bell. "Dere Pres. Ben," addressed by the anonymous Lo Voltage, is B. F. Woodard, past president of the Electric Club.

Dere Pres. Ben:

My little gal—we calls her Flicker cauze she's uncontrolled—well, the other day she comes home from school with a book which sez "Now is the time for every man to come to the aid of his party."

Now I don't know nuthin' about book learning but I sort of liked that there cauze it had a pretty swing to it like "Be it ever so humble there's no place like home" which we used to have on our parlor wall when I was a kid. So I sez, "Flicker, what does it mean?" She looked at me with that funny look which the old woman sez is disgust, and sez, "Well, Pappy, that means everybody should cooperate." That sort of caught me without my safety belt so I sez "Sure, that's what I thought, but just how would you explain this 'cooperation'?" "Well, Pappy," sez Flicker, "There's three kinds of cooperation.

"First, there is the guy that was born a hitch-hiker. He just thumbs his way through life never doing nuthin' for hisself. He waits until he finds someone going his way, then loads hisself onto them and lets them carry him along. That's the guy what don't know no more about the meaning of cooperation than you do.

"Second, there is the guy what talks big but don't ever do nuthin'. He's always getting on committees which he don't do nuthin' to help and promising to attend meetings which he don't show up at. He's the guy what gives lip-service cooperation.

"Third, there is the real cooperator—the fellow what can be depended upon to do jobs that he promises to do. He is the guy what makes clubs successful, what makes industries and cities grow, what makes the world go 'round. He is the fellow you are glad to know—the fellow everybody calls 'reliable'."

Now, Ben, you probably don't give a good gosh darn about all of this, but I was just thinkin' that if that there sentence means what Flicker sez it means it ought to read "NOW is the time for every man to come to the aid of his INDUSTRY."

Yours truly,

LO VOLTAGE.

•

Golden Gate Bridge to Have Sodium Lights, Substation

How fast the electrical industry is advancing was brought into sharp focus last month with the announcement of two important changes in electrical installations on the Golden Gate Bridge. They are the use of sodium vapor lighting and the concentration of substation equipment. In both instances, Chief Engineer Joseph B. Strauss said changes were necessitated by the rapid development of electrical practice during the years since original bridge specifications were drawn.

Speed and safety for motorists on the bridge deck will be assured, even in the foggiest weather, by the change to sodium vapor lighting. Although installation cost will be considerably increased, a 100-per-cent increase in light effectivenss, together with reduction of power consumption, will eventually effect a material saving to the Golden Gate Bridge and Highway District.

Under revised plans, the district will purchase power at 11,000 volts, distributing over its own system through complete substation equipment to be located at the toll terminal on the San Francisco side.

Spinning and compacting of the bridge's 36½-in. suspension cables are completed. Placing of suspender rope saddles is completed, and erection of the suspended structure is underway.

Give the Boys a Break

"YOU will have to stop playing bridge at noon if it affects you that way," said Electra after I had slammed the front door and kicked the cat. "You look sour enough to curdle your son's blood."

"Well if he plans to study electrical engineering when he goes to college, I hope his blood freezes. And as for bridge, I won six bits from the minions of the power trust if that's any comfort to you," I told her as I sank into a chair and opened the local Scripps-Howard sheet to see what happened in "Out Our Way."

"More luck than good playing," she remarked. "But what has you stirred up about college and your profession? I thought you were going to make Junior into another Edison or Steinmetz or somebody."

"After spending half the day talking to three of this year's crop of engineering graduates who are looking for jobs, I'll let Junior choose his own career. Electra, it's criminal the way business and industry treats this new corps of young engineers. They seem to think these youngsters are cocky and worthless and that unless they are suitably cracked down and hazed they will become insufferably patronizing and complacent. And it isn't so. These kids are more than likely to be suffering from an inferiority complex. Most of them are diffident and scared to death. They know that the depression has not been kind to four or five classes of their predecessors. They are looking for encouragement and inspiration and not impatience and intolerance.

"Take one of these youngsters, for instance. He had run up against one of those eminent engineers who had been graduated from the 'college of hard knocks,' one of those pioneers who was proud of his lack of technical education and intolerant of those who have enjoyed this advantage. 'You're not an engineer until you get some practical experience,' he told this lad. 'I don't need youngsters who can figure tensors but want men who can tell within ten feet how much cable and conduit it will take to do a job.'

"How in the name of all that is holy is this lad going to get any practical experience unless he is given an opportunity? Where will he get any pride in his profession if it is not from those who already have arrived at the top? Certainly these fledglings have a lot to learn; but haven't we all? They lack mature judgment and experience all right; but so do a lot of their elders.

"If there ever was a day when this electrical industry had greater need for its full strength, greater need for young blood and new ideas, I can't remember it. I suppose I ought to tell these boys the truth; that engineers who have been ten or more years in the industry are turning to other fields because they hold out greater opportunities; that ours is typically a 'cheap' industry, one that sacrifices itself on the altar of price competition when the going begins to get tough. But then I keep hoping that among these youngsters there may be a Galahad who can help to build in this business a sense of the dignity and responsibility that it merits."

"But what did you tell the three kids you talked to today," Electra asked.

"I suggested that they try to find a spot in the aviation business. It's young, growing, resourceful and short of skilled men."

Here's an idea for some canny inventor to develop. Why not combine a lie detector with the oscillator in a broadcast station in such a way that it would produce a distinct squawk plainly audible to the radio audience without being apparent to the speaker at his microphone! With such an arrangement, an impassioned address might sound something like this: "There has been no politics in the administration of relief (squawk). Local directors have been selected entirely on merit (squawk) they have practiced the utmost economy (squawk) and they have used their funds solely to relieve those in dire need (double squawk). Our only purpose in building dams is to aid navigation and control floods (squawk). We have tried in every way to balance the budget (squawk), to develop world trade (squawk), to reduce unemployment (squawk), to restore confidence (squawk) and to abide by the constitution! (This would put a great strain on our device. Spares should be provided.)

Except for the economic conditions through which this country has passed, there would have been a national memorial to Thomas Alva Edison long ago. Now the Edison Foundation is engaged in a great work properly to bring recognition and acknowledgment of our debt to him.

While it is true that from his brain came more for human happiness and comfort, more for the economic welfare the public and the general uplifting of the standards of civilization, to us in the electrical industry his contributions have added force. *He gave us our jobs.* If every man and woman in the industry would but appreciate this simple fact, the funds to finance the proposed memorial would be quickly and surely subscribed.

Electra suggested that each one of us contribute one day's pay to show our gratitude to the man who has meant so much to the industry. She said that the fund committee could have that idea with no charge.

Our numerous discussions on industry co-ordination and the development of internal good will have overlooked one essential point composed of several elements. These remarks are directed to the fellow who doesn't read his mail, who ignores his telephone calls, who fails to attend committee meetings (or is late when he does attend) and who, in general, is guilty of genuine discourtesy toward his associates who are endeavoring to do something for the improvement of conditions.

Here's the way it works: A condition arises calling for group consideration. A committee is appointed and busy men lay aside their personal interests to work for the common good. A notice is sent out. To save time and stamps, it is mimeographed. The man I am talking about throws it in the waste basket. So somebody telephones and, as our man is away, word is left for him to call back. No answer. Finally he is reached and he agrees to come. Nine-tenths of the committee show up on time but hesitate to start because all are not there. Either our man does not come or he drifts in half an hour late. He never phones to explain. And quite likely he will want to leave before the work is finished.

Brother, if you are guilty of any of these things, Electra's husband is talking to you!

Electric Brooders for Pigs Reduce Farmers' Losses

By D. B. LEONARD
Agricultural Agent, Pacific Power & Light Co.

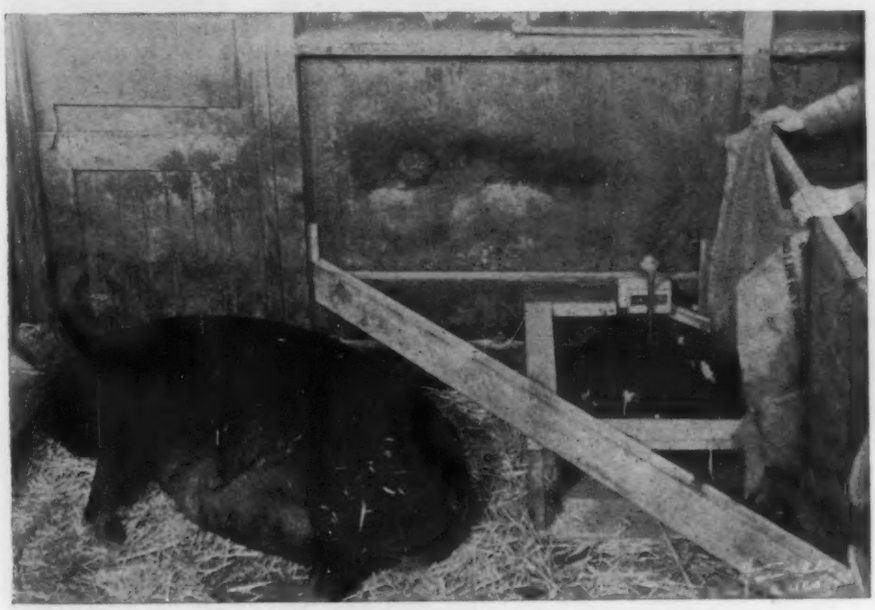
SUCCESSFUL field operation of electric brooders for raising young pigs opens up a new rural market for same time permits the farmer to reduce his losses and assures him of a premium market for early spring hogs. Four electric pig brooders of a type developed at Oregon State Agricultural College by F. E. Price, agricultural engineer, cooperating with the Oregon Committee on the Relation of Electricity to Agriculture, were installed in the spring of 1936 on the farm of L. C. Brandt, of Lostine, Ore. The brooders were used to raise twelve litters of early pigs and Mr. Brandt estimates that through their use he saved eighteen more pigs than would have been possible without the use of this equipment.

In regions of severe climatic conditions during the late winter and early spring it is impossible to farrow pigs without the possibility of heavy losses due to cold weather. Through the use of electric pig brooders swine growers will be able to breed their sows for earlier litters. The sows may be expected to farrow in December and January if the growers have assurance that they will be able to save the small pigs during the severe winter weather. These early litters will grow into marketable size sufficiently in advance of the normal season to take advantage of the premium offered on the early spring hog market. This premium is sufficient to add materially to the value of the pigs produced.

In the case of the installation on the Brandt farm experience showed that the small pigs when first born were not sufficiently active to find the brooder and had to be watched closely for 16 to 24 hours until they learned its advantages. After 24 hours it was found that they would go to the brooder whenever they got cold and that in severe weather they remained in it practically constantly except for feeding periods.

One litter of pigs was farrowed on Feb. 20 when the temperature stood at 4 deg. above zero. An electric space heater was used the first night to keep the small pigs warm and after that the pigs quickly learned the location of the brooder and depended on it for warmth from then on. Nine pigs were farrowed in this litter and eight were raised to maturity.

The pig brooders were used for a week to 10 days, at the end of which time the small pigs were sufficiently active and vigorous to keep warm without artificial heat. The cost of electric energy to operate the brooders was estimated by Mr. Brandt to be 4 cents for 24 hours. In the case of a litter of eight pigs remaining in the brooder 10 days the cost would be approximately 5 cents per pig.



Electric brooder of the type developed by Oregon State Agricultural College and used in the installation on the Brandt ranch in Oregon. The young pigs are on a 2x3 ft. metal pan. The hover and burlap curtain is raised to show how the pigs seek the warmth of the brooder. The 2x8-in. timber at the right is fastened in place to prevent the sow from getting into the brooder

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B. C. Electric Offers New Four Year Extension Plan

Continuing its program of promoting the use of electric power throughout the rural area of British Columbia, the B. C. Electric Railway Co. has now announced a new light and power extension policy. Under the new system, the customer who has secured a special extension to serve his premises in the Fraser Valley section of British Columbia is enabled to spread out the excess cost of the line above the firm's regular allowance for extensions over a four year period. In addition, however, it is possible for this customer to use current at the regular rate for every cent that he pays towards the cost of the extension.

Thus, if an extension of five poles in length cost $195 and the monthly payment for four years was established at $4, the customer could use power to the extent of $4 per month without extra cost.

This means that the company will supply free electricity up to the value of the amount being paid monthly on line extensions by new customers. In order to secure the benefit of this amount of power, salesmen of the company are pointing out to customers that they can easily use up to the 103 kilowatt hours which $4 per month represents by installation of barn lighting, farmyard lighting, poultry lighting, pumps, and other labor saving devices, while installation of an electric range will represent about $1.50 monthly.

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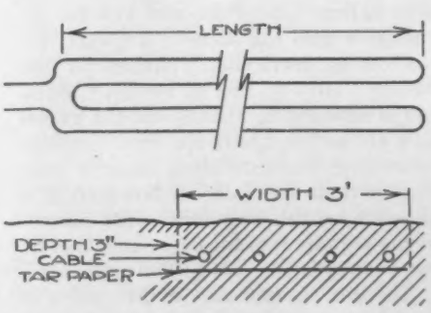
• ELECTRIC BROODERS of the forced-air-draft type are a fast growing load on the Puget Sound Power & Light Co. Farm representatives gave assistance to 279 brooder customers the first two months of this year. This is 64 per cent of the number made during all of 1935.

Soil Heating Cable Adapted to Brooding of Turkeys

By P. L. FORD
Agricultural Specialist, Pacific Gas & Electric Co.

INCREASING adaptability of soil heating cable for a wide variety of rural applications is demonstrated by another new use, namely, the brooding of young turkeys. As the result of experiments conducted on the writer's ranch during the early spring of this year, more than 8,000 ft. of soil heating cable has been sold in the Oakdale section of the San Joaquin valley for this new use. Simplicity of construction, freedom from fire hazards, economy of operation and low mortality among the young poults are advantages which accrue to the turkey raiser who employs this new method in raising his young birds.

That soil heating might be adapted to turkey brooding resulted from observations of the degree to which larger turkey growers in the Oakdale region were using the so-called Husman brooder. The heat source for this brooder is a 6-in. pipe laid under the surface of the ground with a pit at one end in which is located either a wood or oil burning furnace. A brooder of this type, despite the distinct advantage of simplicity, requires considerable attention so that there will be no interruption in the heat supply. Location of the source under the surface of the ground led the writer to believe that soil heating cable could be used successfully due to the fact that the initial cost is low and the cable is simple to install.



Top—Schematic plan of cable as it would lie in trench. Below—Schematic section of cable trench

Early in the spring a 60-ft. unit was installed on the writer's ranch at Escalon and 200 poults placed in it for trial. The results were so successful that several of the larger turkey growers were invited to inspect the installation. Their stamp of approval was unanimous and as a result many of them are using this type of brooding. They report that their mortality has been very low and that they are more than satisfied with the results achieved.

A typical installation of the larger type now being used consists of two units with 480 ft. of soil heating cable installed in each. The cable is placed in a trench 3 ft. wide and 3 in. deep. Under the cable is a sheet of light roofing paper to prevent the warm cable from drawing moisture from beneath. One inch of dirt is placed on top of the paper, the cable is then laid and finally covered with 2 to 2½ in. of dirt. In this particular installation each of the two units consists of four sections with 120 ft. of cable in each section. A section is 36x3 ft. The cable is spaced from 4 to 5 in. apart and may be placed closer if temperature conditions require it. Temperature on the top of the soil is maintained at from 95 to 100 deg. One thermostat controls the entire 480 ft. of cable.

In some installations a small attraction light is placed in each compartment for the purpose of attracting the small birds into the brooder at night.

One distinct advantage of a brooder of this type is that any power interruption would not be noticed for several hours due to the fact that the soil surrounding the cable would hold the heat for a considerable period of time. Another advantage is that the surface of the ground under the brooder is dry at all times so that the birds are not forced to roost on wet dirt.

It is anticipated that during the next turkey brooding season many similar installations of this type will be made by the turkey growers in the San Joaquin valley.

• FARM electrical equipment sales on the lines of the Pacific Power & Light Co. for the first four months of 1936 were 40 per cent of the year's quota. Included in the sales were 163 electric brooders, 89 water systems, 49 stationary spray plants and 58 electrical incubators.

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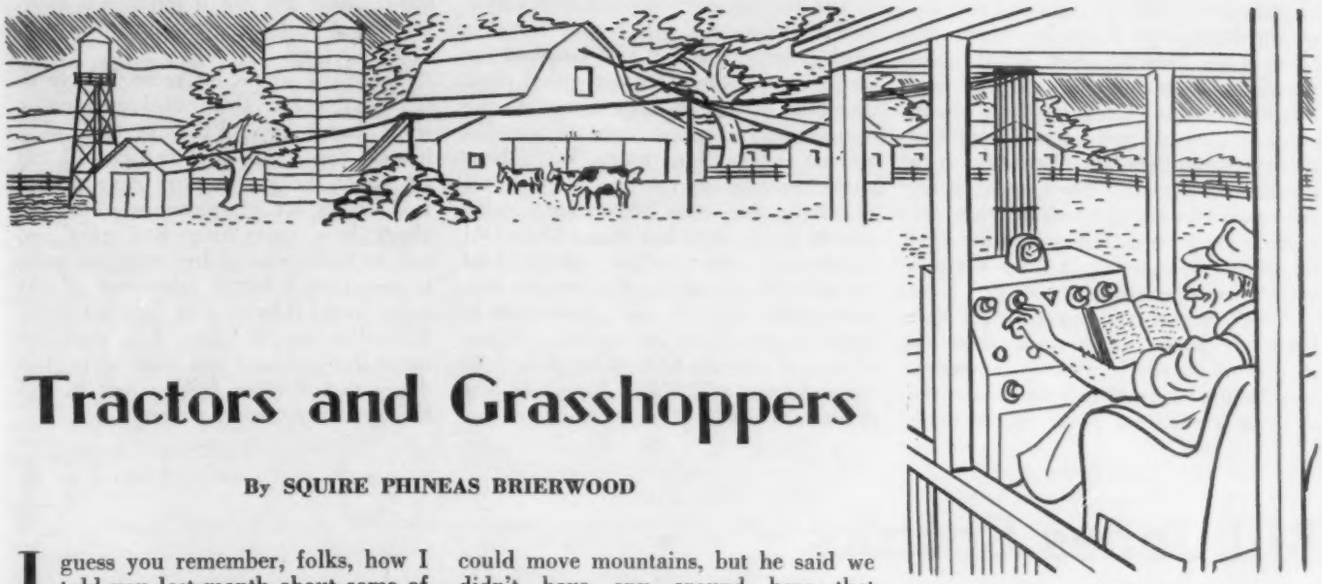
Begonias Thrive in Heated Solution

After the harvesting of the final tomato crops from the electrically heated tanks of nutrient solution at the Vetterle & Reinelt nursery at Capitola (EL WEST, May, 1936, page 19) tuberous begonias were planted in the tanks. This shows the luxuriant growth and huge blooms which resulted. The Gericke technique will again be followed at the nursery for growing tomatoes out of season for the 1936-37 winter market. Planting is being done at present and the crop will reach the market earlier than the initial one raised last year



Tractors and Grasshoppers

By SQUIRE PHINEAS BRIERWOOD

I guess you remember, folks, how I told you last month about some of the out-door electric work that had been done on my Farm up here in the Hollow, told you about the Tractor doin' its own ditching and plowing. Of course I figured if it only had one of them Eyes on it, why maybe it wouldn't need me around giving it orders or bossing it all the time; fact is I could go to town whenever I felt like it and the farm work would go on just the same. I've heard them tell about these absent landlords, but never really expected to be one of them myself. But I'm beginning to think that Electricity will make anybody a landlord if he uses it long enough.

Anyway, as was suggested, the electric fellow rigged up on the front end of the tractor a ten-foot pole and on the very top of it he fastened the Big Eye—hooked it fast, though, so it could sort of revolve or look in any direction that it wanted to. Then he installed one of those Loud Speakin' things on the dash board and right along side of it nailed a small box. I asked him right away what was the idea of the big pole and he said the eye would then be high enough to look right over the fences as it mozzied along and could therefore see better just where work was to be done. Then I asked him what was the box for and he said that was for the money the tractor collected for doin' all the work. Well, when everything was ready we run her out on the turnpike, gave a couple of buttons a push and started her off around the neighborhood looking for her own job.

As this appeared to be a very advanced type of electric work you can imagine that I was just a mite scart as I saw her go, but the electric fellow said it would be alright, that he had faith in it anyway. I told him mine hadn't got to the point yet where it could move mountains, but he said we didn't have any around here that needed movin' right now so why worry about that. Seemed kinda logical the more I thought about it. Well, we hung around a while to see just what would happen, but as I saw her going around the curve my courage was certainly oozin' fast. About an hour later we took a short-cut across the meadow figurin' we'd catch up by the time she got to Hust Seebles' place. We got there first and both of us hid behind a big tree.

Pretty soon here she come, sort of strolling along it seemed to me and the big eye was alookin' over the fences here and there sizen things up. The electric fellow said Hust's corn needed plowin'. She slowed down a little and the Eye got an eyeful of just what was needed and then, I'll be bushwacked, she turned right in and went to work on the first row of corn. We hung around a while and then seein' that everything was going along alright, lit out for home. Hust told me the rest the next day, said it took all day to finish and then when the work was done the Loud Speakin' kept saying, "Three dollars, please, three dollars, please!" Hust was darn glad to get off so cheap and after collection had been made she went on lookin' for another job.

Reports kept coming in from the folks up and down the Hollow saying what a bang-up job my tractor was doing, and I'm booked up right now for at least ten days work. Guess I'd better order another tractor right away so that we can slick up the whole neighborhood and try for the Community Prize offered by the Oakdale *Breeze*. If our community could win it I would just as soon run the tractor for nothing if I can help out some of the folks less lucky than me. I forgot to tell you that when the tractor came back home the next night there was $7.20 in the cash box and an I. O. U. for $2.60 more. I noticed, though, that the Big Eye looked a little mad. I heard some time later that old Skin Flint down the pike about a mile tried to do a little short changing but the Eye gave him such a dirty look that he finally paid up in full. But say, ain't this electric stuff the darndest thing you ever heard of? Why, I suppose I'm rich right now and here I don't even know it.

I've been hearin' how some fellows have been saying lately that the only way for the country to be prosperous is to kill off everything and plow the rest under—let the land lie idle or doormat. I see myself in the Oakdale *Breeze* where they tried it out last year somewhere around the country and then when the big Spring winds came they naturally just blowed the whole darn farm away, there bein' no roots or nothing to hold it down. Editor Harper suggested a better way than that—train armies of grasshoppers to go through and eat everything right down to the roots—they wouldn't need any trainin' to get down that far—at least we'd have the roots left if we ever wanted to start up again.

Speaking of grasshoppers reminds me about my own electric grasshopper control outfit. I guess you know that our prevailing winds are from the N. E. and there's a big draw right up the Hollow. Grasshoppers used to pour in up here after eatin' everything there was down the creek. Then they'd roost up in the trees trying to figure out just who they were going to jump on next. Well, they used poor judgment and jumped on me but, by gravy, they jumped right off again—that is, those that had enough strength to do it. Tell you just how I did it—I mean how the

electric fellow did it. Around the top of my barb wire fence he strung another wire, then he stuck small poles up about 15 feet high and about 20 feet apart. Then on top of the poles he ran another wire all around and here and there hung more wires from the top to the bottom strands. Then to make the job complete he climbed up that old hickory tree and hung another Old Reliable Eye that would keep a watch over the whole farm.

Well, sure enough just a little bit later we have our annual invasion, or you might say it was the Grasshopper Annual Convention—and when the eye saw 'em comin' it set in motion—so the fellow said—the electric Vibrators. Of course, when the hoppers tried to get through it just knocked the stuffin' out of them, in fact, piled them up about four feet deep alongside the north fence. I guess word of the disastrous convention must have been passed back along the line for big bull grasshoppers were detouring traffic around my place after that. Poor Old Caleb—his one button outfit just couldn't take care of the swarm that poured in on him and consequently they ate up his early crop of cabbage slick and clean. At that he gained in the end for I told him if he would just drive that big flock of turkeys he had down along my north fence, I'd show him four feet of grasshopper steaks, 170 rods long.

There's a whole lot more I have to tell you about this out-door electric work, but I guess I'll have to send it in next time. My next report will tell all about the garden and ma's posies. I've had a lot of questions asked me about how everything was goin', so tell anybody who is interested to write to me (you'd better take care of the mail) and I'll be glad to do what I can. This Electric Business has done so much for me and ma that we're just dying to tell other folks about it. So I'll see you again next month.

Bill Jones Speaks + + +

To the Commissioner

BILL Jones toured his model A around and around the block seeking a temporary resting place for his chariot. His timing seemed faulty—just a little bit too late to edge into the place vacated by a departing car, or just a bit too early. Finally he found an unoccupied spot, drove by and was preparing to back into it when a red-headed woman blasted her horn viciously and squeezed diagonally into the place he was trying to enter. Bill cussed vociferously and picturesquely and again started on the rounds. "Molly," he said to Mrs. Jones, "I'll meet you at the dime store at 2 o'clock." Bill stopped and Mrs. Jones got out amid much raucous honking behind. A few minutes later he entered the elevator of an imposing building; got off at the twenty-fifth floor; opened a door on which was lettered "Public Service Commission"; entered a reception room; gave his name to the young lady who was manipulating a small switchboard with one hand while dexterously placing folded sheets into envelopes with the other. She breathed Bill's name into the mouthpiece; smiled, and waved him to a leather settee nearby. Quickly a door opened on the little corridor and a man rushed out, grabbed Bill's hand and pushed him along.

"Well, Bill Jones! Of all people to see here. What are you doing in this part of the country. How are you anyway?"

"Just fine, Mr. Commissioner," smiled Bill. "And how are you and your old 'soak-'em' department?"

As though by accident, some papers worked out of Bill's coat pocket and tumbled down to the floor. He, grumblingly, gathered them up and laid them on the desk for rearrangement preparatory to returning them to their original cache. Most of the pile was postcards showing posings of successful and smirking fishermen holding strings of large trout. The trout, according to the legend printed beneath the picture, ranged in size from three to twenty-five pounds. The Commissioner began picking them up. His eyes gleamed—almost his mouth watered. For each of several years Bill had invited him to make the trip West where fish are fish and where they are venturesome and unafraid and large and savage. In Bill's letters the finny specimens had got progressively bigger and more numerous each year. Each season the Commissioner had promised himself and Bill that the succeeding one would find him visiting Bill's country.

Ethiopia had just fallen; the President's Tax Bill was being mangled in the Senate; Karpis had just gotten himself into the hands of the G-men; interpretations of the primaries over the country were in the head lines; but none of these evidences of human frailty and crooked thinking were more than incidents. But fishing! There was something worthwhile—compelling!

Later however, in a small dump recommended by the Commissioner where the food was good and the surroundings were awful, the talk inevitably got around to the public utilities.

"You know, Bill," said the Commissioner after Mr. Jones had lighted his pipe (it was that sort of a place), "by the grace of God and by that of three Governors, for nearly sixteen years I have been chairman of the Public Service Commission. On the whole it has been an interesting job, but much of it makes me wonder. Representatives of the people on one side and spokesmen for the utilities on the other, each seeking to get the edge; neither really trying to be helpful; neither entirely fair. I sometimes ponder over it all and wonder just why it should be so. Quite generally those who come before us representing the people are lacking in fundamental knowledge, for which deficiency they substitute prejudice and sometimes vituperation. Almost never does the electric company put its cards face up on the table with us. It places us in the position of being prosecutors when we would like to be entirely judicial—if they would let us.

"I often wonder how these company managements can be so remote from the people and so oblivious to significant trends. If we decide against them they complain that our decisions are political—just an appeal to the rabble. And yet having demanded more than

they have reason to expect, how could it be otherwise? They assert that they have to contend for more than is really fair because in any case the Commission will scale it down. I wonder if that is really true. I know that in my own experience I have many times burned the mid-night oil in an effort to extract and nail down simple facts camouflaged and complicated by lawyer-rehearsed experts. And yet rate hearings should be easy. The facts are readily obtainable and are readily produced—if obstruction is not placed in the way of the enquirer. Principles are rather well established by the commissions and by the courts, and yet nothing is more laborious than the proceedings of a rate hearing. Why should it be so?

"More than once I have decided against contentions of the utility, primarily for its own good. Circumstances were such that a further continuance of its course and an acquiescence in its claims would have resulted in serious loss to its own shareholders in the end. Perhaps it is true that occasionally facts must yield temporarily to expediency, but if my associates and myself are honest and competent we should be aided by those whose lack of vision and whose mistakes we seek to rectify. I don't know how many times, in the years I have been acting as Commissioner, I have listened to arguments and testimony having to do with fair return, wherein the attorney for the utility seemed to feel it would be sacrilege to even consider any figure less than the sacred one of 8 per cent. In his argument he complains that in periods of general prosperity the state, by its power of regulation, has decreed that the company may not recover its losses incurred during depressions.

"Another thing sometimes makes me wonder. Being human, with none of the omnipotence of a Deity, it is but to be expected that management—any management — will make mistakes, sometimes costly. You do it, I do it, everybody does it, and when you and I make them we have to pay for them. I have to sit in our office and listen day by day to high-priced attorneys denying that there have been any mistakes of managerial judgment, and even if there have been any such they were made in the interests of the people who therefore should condone them by paying for them through static valuations. Perusing operating expenses of some utilities I frequently wonder if, instead of being utilities, they were manufacturing concerns with competition, without customer underwriting and without the great boon attending state-protected monopoly they would not be radically cut down. I know that they would.

"Also I sit here and watch utilities branching out, extending into lean territory which for some reason or other they wish to corral but which can hardly pay its way for years, if ever; when at the same time they are seemingly oblivious of the gold mine right in their own back yard crying for profitable and useful development.

"Then I watch various transient fads of business load-building. It is quite possible for a company to work itself into a position where the more kilowatt-hours it sells the more money it eventually will lose. I could name a now prosperous company which is getting along nicely and is paying good dividends, but which if it should double its output would go into bankruptcy. If I were a utility executive—in this time particularly—I would pause, look up and down carefully and cautiously to see if beyond the turn of the road it opened out into the great out-of-doors or whether it just dead-ended. More than one is today heedlessly rushing into an alley from which there can be no turning around and backing out.

"And then there is the company which cannot break from the theory of commer—"

"Yeah," snorted Bill, "but the fish are biting in my country and they are growing so vicious that they are positively a menace to women and children on the banks, where girls in their bathing suits lounge in the sands afraid to venture into the trout-infested waters. Good-bye. Come out and get some real fishing. I got a date to meet Mrs. Jones at the ten-cent store right now. Good-bye, old Dictator, good luck!"

He met Mrs. Jones. "Oh, Bill," she said. "I had a most wonderful time, spent two hours and got lunch right there. What did I buy? How much did it cost? Twenty cents, including the lunch."

They reached the flivver. Under the wiper was a pretty little red card. Bill took it out; looked at it. "I waited thirty minutes for you. Do you plan to share with me in digging up this dollar?"

"Oh, Bill, this is so sudden."

Goodwill Building + + +

["With public sentiment nothing can fail; without it nothing can succeed; consequently he who moulds public sentiment goes deeper than he who enacts statutes or pronounces decisions."—Lincoln.]

Build Goodwill by Distributing Good Booklets

28 It would not hurt us to copy a leaf from the success book of other large companies or organizations where this question of Goodwill is concerned. One of the largest insurance companies freely distributes twenty or more booklets, each on some vital and interesting item of personal or public health. They do this because it pays to have their policy holders health conscious. They also know that because of the distribution of this information, and other advertising of a similar nature, the general public will come to think of the company as a benefactor to mankind, instead of a huge financial machine designed by its builders to make enormous salaries for the executives.

We could have an interesting series of booklets printed, entitled "The Romance of Electric Power." Different numbers in the series would tell how electric power is used in making automobile tires, steel products, and hundreds of other products which form a vital part of our daily life. Well written booklets containing interesting information would surely find an eager public acceptance. Detailed, yet non-technical, descriptions of just how the energy of falling water is converted into power and sent to the home and factory, would be of interest to the public. Included in this could be some simple arithmetic as to the investment necessary in relation to the number of kilowatt-hours delivered to the consumer. This should dispel from the public mind the idea that water power is free and therefore the power company could practically give the 'Juice' away, if it wasn't such a profiteer.

One thing that a great many people seem to resent about the modern power company is its monopolistic nature. If the public can be shown that the extensive operating and distributing facilities under one management are to their

own interest, then their goodwill toward us will be increased. The way to do this is not by argument but by the presentation of actual typical instances of benefit. There have been at least two outstanding cases in recent years in Southern California. First the tragic San Francisquito flood which plunged Los Angeles and vicinity in temporary darkness. At the time of the Long Beach earthquake, of March 1933, the extensive facilities of a monopolistic power company provided many hundreds of people with the only means of cooking and heating available. And it was provided gladly and without charge. Such historical incidents would make interesting booklets to add to our series.

At present the public is besieged by two classes of written material concerning the electric power company. One attempts by every device to sell something, the other is political and attempts by every device to blacken the good name and intentions of the electric power companies. Let us give the public another class of reading material which will soften the blow of the first and show up the second class for the vicious propaganda it is.—*F. V. G.*

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Courtesy and Graciousness Are Goodwill Builders

29 Thank you—with a smile. Whenever you go into your favorite store, make a purchase and leave, you feel a much closer feeling toward the firm, if when leaving, the manager greets you and thanks you for coming in and invites you to call again. We also feel well at the end of the year if the firms from whom we do our grocery buying, or coal, or what not, send us a little greeting in the form of a Christmas card, or otherwise thank us for our past business and graciously solicit our future patronage.

Then why don't we, as a public servant, adopt some way in which to express our appreciation to our customers, at least once a year, by thanking them for past business and hoping for pleasant relations during the year to come?

Our cashiers are busy and do not express a thank you in a sincere tone when the bill is paid at the window, and in other cases the bill is paid by check in the mail and no contact is made.

One of our executives once said that the only way our customers have any contact with us is when something is wrong, either with the service, or the bill, and then it is usually an unfavorable impression.

I suggest that we take advantage of our opportunity to be appreciative of the business we receive from our customers, and at least once a year contact them with a "Thank you for past business and a hope for continued pleasant relationship." In mailing this "Thank you" a request for suggestions for improving service could be asked of the customers, and in this way a personal contact could be established with many customers, and they would feel that instead of doing business with some "Heartless Corporation," they were actually doing business with their neighbors, and that the people who manned the Electric Co., were human beings, just as people who manned other places where they do business. —*H. M. S.*

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Slight Instruction Would Save Trouble for Two

30 Have you ever thought how disgruntled a housewife becomes when she is in the midst of a washing and burns out a fuse—and has not the least idea what the trouble is? She calls the trouble man, and while he is making calls which came previous to hers, the suds cool, and she becomes thoroughly disgusted with all utility companies. Why wouldn't it be possible to teach housewives — by giving that job to the meter reader, or by special men assigned to that work—how to tell a burned fuse, and how to change it. Comparatively few women know a thing about it, and many are afraid even to open the fuse box.

This little bit of knowledge would often save trouble which is extremely annoying to the housewife, and surely would go far toward building goodwill. —*C. D. L.*

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Rules

TO intensify interest in the problem of building customer goodwill ELECTRICAL WEST will pay $2.50 for each idea or suggestion deemed worthy of publication. In addition all suggestions received during the period from November 1, 1935 to October 1, 1936, will be eligible for $50 in awards to be given by ELECTRICAL WEST, the P.C.E.A. and the Northwest Electric Light & Power Assn. These awards will be based upon the goodwill building merit of the idea, its practicability, adaptability and originality. The judges will be officers of the two associations and the editors. The awards will be $25, $15 and $10 for the three suggestions ranked first, second and third by the judges. In the case of ties duplicate awards will be made.

Suggestions should be limited to 400 words, preferably less. Composition does not matter as manuscripts will be edited for publication by the editors. Ideas will be published over a nom de plume, provided the author indicates that such is his or her wish. They should be sent to the editor.

Let Ironer Prospects Learn *by* Themselves

31 Many people seem dubious about an ironing machine. The usual remark is, "I'd have to use my other ironer for everything but flats, and most of those I don't iron anyway."

I have had my ironer only a few months, and use it for everything. Never do I finish an ironing that I don't feel thankful that modern science provides such a convenience. In telling my friends about it, not one of them has become interested, but I loaned it to one woman, and in less than two months she had purchased one—and had had no intention of doing it before. For another friend, who was even sarcastic about my ironer when I bought it, I did her ironing during illness in her family, and she is now saving money to buy one. These women know I have learned to use mine alone, without even a demonstrator, and it gives them a confidence in themselves, which they do not feel when a demonstrator teaches them.

Why wouldn't it be possible for a utility company to provide ironers through its local offices, (also reflector lamps and mixers are indispensable after given a trial) to be taken into the homes, free of charge, for at least two weeks at a time—with a book of directions—and not a demonstrator—the efficiency of a demonstrator tends to discourage the housewife in her first attempt.

An ironer cannot be said to be a load builder, but is very definitely both a time and labor saver, and if you doubt its being a goodwill builder, "just ask the woman who owns one."—*C. D. L.*

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LAST CHANCE

• OCTOBER 1 is the last day upon which goodwill suggestions will be eligible for the $50 in awards. Thirty-one ideas already have been printed in ELECTRICAL WEST, giving their writers $2.50, and the electrical industry immeasurably more through pointing the way to happier business relations. Others in the industry await your suggestion. This is your last chance to help them and yourself. Write out *your* idea as to how goodwill could be built and send it to ELECTRICAL WEST today.

In The Realm of Science + + +

[*Devoted to the research and scientific developments which affect the electrical industry and which are being carried on in the engineering departments of Western universities. Edited this month by Prof. W. A. Hillebrand of the Electrical Engineering Dept., University of California*]

Stanford Builds Automatic Photoelectric Photometer

By LELAND H. BROWN
Assistant Professor of Electrical Engineering, Stanford University

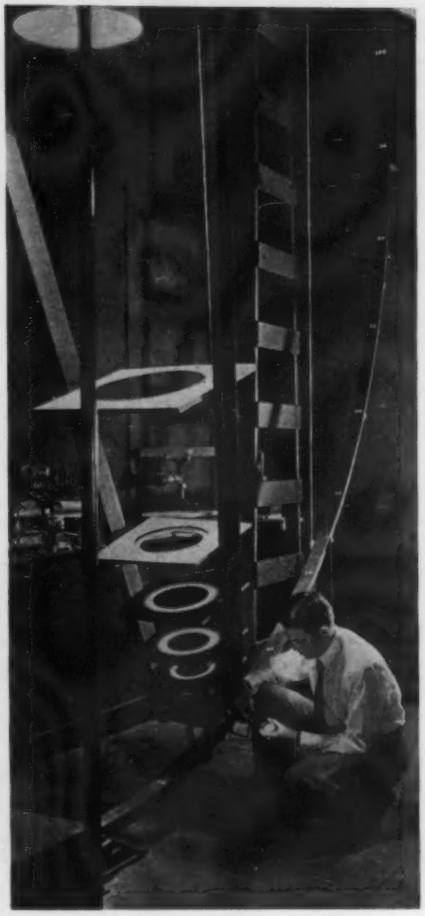
IN illuminating engineering it is very important to know how light sources distribute their light; how luminaires take the light from their light sources and redistribute it; and finally the efficiency with which it is done. Such information not only is needed by the designers of lighting units to determine how closely they are securing the results they desire; but also is necessary for manufacturers of lighting equipment to insure uniformity of product and maintenance of the standards desired. Such facts and data are absolutely essential also for the engineer designing lighting installations as they enable him, first, to select the type of lighting equipment that will provide the results and effects he desires and second, to determine the most efficient and economical type of unit for a given installation.

This information can be obtained only with some form of distribution photometer whereby the average candlepower intensity of the lighting unit is measured, usually every 5 deg., for vertical angles from 0 to 180 deg. Ordinarily these results are shown graphically by means of a candlepower distribution curve obtained by plotting the results on polar coordinate paper. The lumens emitted at various angles and also the total lumen output may be readily calculated from these data. By comparing the total lumen output of a luminaire with the total lumen output of its bare lamp, the efficiency of the luminaire easily may be determined.

Older distribution photometers were operated visually. Candlepower was measured by visual comparison of brightness of two windows, one lighted by the lighting unit at the angle in question, and the other by a comparison lamp. That average candlepower values might be read, the lighting unit was rotated. Naturally such an instrument required skilled operators and at best, was slow in operation because of the many readings which had to be taken at the same angular setting to eliminate the effect of eye fatigue.

Two recent developments made the photoelectric distribution photometer possible. These were the photovoltaic cells—photoelectric cells which generate minute currents in proportion to the amount of light falling on them—and the sensitive illuminometer, as developed by the Weston Instrument Co., using two of these photoelectric cells. Accordingly a distribution photometer incorporating a Weston illuminometer as the measuring device was built at the Stanford Illumination Laboratory in the spring of 1932 by William Armstrong, a graduate student. The illuminometer was mounted on a carriage running on a horizontal track.

Stanford's new automatic photoelectric photometer which eliminates the human error in obtaining efficiency curves on lighting units, speeds the procurement of data and gives accurate readings for all angles



The carriage was firmly attached to one end of a baffle system 10 ft. long, the other end of which was supported by rods from a platform carrying the lighting unit. When the platform was raised or lowered, the carriage would roll along its track and thus the baffle system could be set at any desired vertical angle. The track shown in Fig. 1 was used for angles from 0 deg. (Nadir) to 90 deg.; and a track on the ceiling, angles from 90 deg. to 180 deg. (Zenith). Ceiling height limitations in the room where this photometer was placed necessitated this rather awkward method of obtaining the desired vertical angles.

Tests with this instrument showed that many improvements could be made. The illuminometer was not a sensitive enough measuring instrument for precise work. Settings of the vertical angles consumed extra time and required two men. The baffle system, having fixed openings could shield only one size unit accurately. Smaller sized units gave erroneous readings because light was reflected from the walls of the room into the photometer. Therefore, when the illumination laboratory was moved to its present building an available vertical height of over 20 ft. made an instrument of different design possible. Accordingly it was decided to design and build a distribution photometer that would be as automatic as possible so that one man could operate it alone. Preliminary sketches for this design were made by Mr. Armstrong and the instrument itself was built by Fred Russell, another graduate student, as a thesis project in 1935.

The new distribution photometer consists of a baffle system 10 ft. 3 in. long, one end of which is supported on bearings approximately 11 ft. from the floor (see Fig. 1). The outer end is fastened to a chain, the latter running over sprockets mounted at regular intervals around a semicircular track 20 ft. in diameter. The photovoltaic cell

is mounted at the outer end of the baffle system, its distance from the central axis being exactly 10 ft. A three-phase induction motor with reversing switch drives the chain and thus moves the photocell end of the baffle system around the semicircular track, facilitating the setting of any desired vertical angle.

The lighting unit to be tested is mounted on a platform running on a vertical track. This allows the unit to be mounted in the photometer at any convenient height, adjusted so that it will rotate truly; and then, raised and fixed in the test position where the center of the lamp filament coincides with the axis of rotation of the baffle system. A ball bearing mount permits the lighting unit to be rotated at a speed of about 80 r.p.m. by a belt-driven d.c. motor so that the photocell will measure the average candlepower in the direction in question. To baffle all types of lamps properly, the photometer is equipped with an adjustable iris diaphragm having a maximum diameter of 12 in., making it possible to test lamps and lighting units up to about 30 in. in diameter.

The photocell is connected to a sensitive Leeds and Northrup galvanometer, deflections of which are read by means of a lamp and scale. As the maximum deflection of the galvanometer would vary over very wide limits for different sizes of lamps and luminaires, it is regulated by means of stops placed in front of the photovoltaic cell. Thus, by using a large diameter stop, full scale deflection may be secured with a comparatively low wattage unit, and thereby maintain the accuracy of the measurements over a wide range of lighting intensity.

The Weston photronic cell used in this photometer has to be stabilized by being illuminated for about 10 min. before starting a test, after which galvanometer readings can be repeated with an accuracy of about 0.5 per cent during the course of an hour or so. Due to gradual changes in cell sensitivity, readings taken on one day may differ as much as 2 per cent from readings taken some other day with the same lamp operating at the same voltage. Fortunately these changes in sensitivity are so slow that they will not affect measurements if proper technique is followed. Data for a distribution curve of a bare lamp should be taken immediately prior to or subsequent to taking the data for the luminaire. Thus the photocell is in the same condition for both tests, making the luminaire data directly comparable with the lamp data.

In these tests the lamp is operated at about 10 per cent under-voltage to prevent filament distortion when the lamp is rotated. The lumen output of the lamp at this reduced voltage is calculated from the measured data and the multiplying factor needed to convert the measured lumens of the lamp at 10 per cent under voltage to the lumen output at rated voltage is determined. The multiplying factor then is applied to all the photometer readings of the lamp and luminaire giving the calculated values used for the candlepower distribution curves of the unit. This technique makes all luminaire values relative to those of the bare lamp and automatically calibrates the photometer every time.

The spectral response of the ordinary photovoltaic cell differs from that of the human eye. Consequently this distribution photometer at present is used only for testing luminaires which do not change the color temperature of their light sources. Manufacturers are working on filters which will make the spectral response of the photocell the same as that of the human eye. The use of such a filter will enable this photometer to be used for luminaires which have color corrective qualities.

This distribution photometer is automatic in that a buzzer indicates when the lamp filament coincides with the center of the photometer. A buzzer also indicates when the photometer reaches each 5-deg. position, movement being made by the motor-driven chain and sprocket previously described. One man can easily operate the instrument. However, the galvanometer deflection has to be read and recorded for each setting of the photometer. As this is a possible source of error, Willard Waite, a graduate student, has done considerable work on the construction of an automatic photographic recording device. When this is completed the Stanford photoelectric distribution photometer will be entirely automatic. Besides the speed and accuracy that this will make possible, curves taken with this instrument will also have the very desirable feature of being correct for all angles and not for only every 5 deg. as is the case with present distribution photometers.

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New Type Lamp Sterilizes All Kinds of Foods

A NEW low-wattage gaseous conductor device which produces radiations germicidal to mold spores in the air and known as the "Sterilamp"* is announced by the Westinghouse Lamp Co. Annual food spoilage, which runs into millions of dollars and which is one indirect cause of high food prices, is largely the result of mold spores. Baked goods, treated with these germicidal rays, remain mold-free for longer periods and can be completely consumed in the home before they spoil.

Permeating the air of refrigerator storage rooms with these germicidal rays kills mold spores and spoilage bacteria, makes it possible to tenderize, or "age" meat at higher temperatures without danger of spoilage from mold or putrefaction. The process is speedier and promises considerable savings in refrigeration costs and reduced trimming losses.

For years scientists have known that certain radiations outside the spectrum of visible light possessed germicidal characteristics, but they have never been able to devise means of producing them economically and practically. The new Westinghouse germicidal lamp produces these rays efficiently and effectively. It is a slender glass tube containing a small quantity of special gas. Electricity sent through the gas produces the germicidal rays.

"A number of years of experimental tests and practical applications have definitely established the effectiveness of the germicidal rays for preventing the growth of mold and bacteria on the surface of meat aged at relatively high temperature and high humidity, and in retarding the growth of mold on bakery products", says Dr. Robert F. James of the Westinghouse lamp research laboratory, who developed the new device.

In the meat industry the lamp eliminates trimming losses incurred with ripening meat, which frequently mean the difference between profit and loss to the butcher. Meats may be hung in an atmosphere of 90 per cent or higher relative humidity.

In the baking industry considerable success has been enjoyed with the new lamp. In one plant 250,000 fruit cakes were treated or "sterilized" with the result that spoilage was reduced from 15 to 2 per cent. In another bakery cakes treated with the lamp had their mold-free life extended from 1½ to 2 days. Deliveries thus can be cut from every day to once every two days.

Purification of conditioned air is possible by installing several of the lamps inside the air duct. Still another application is in insect control. Common houseflies attracted by the radiation die after a few minutes exposure and fruit flies, roaches and grain weevils refuse to enter the area of exposure.

The lamps operate on a. c. through a simple transformer, three or four lamps functioning from one transforming unit. Consumption of two lamps is approximately the same as for an ordinary 25-watt Mazda.

* Trade-mark.

Cooperation on Parade + + +

[*Forecast of forthcoming cooperative merchandising activities, and review of activities in progress or completed, a summary of cooperation at work throughout the West*]

Going to School to Sell Ironers

BACK of every activity of the Electrical Appliance Society of Northern California is a good sound reason. Usually that reason springs from experience itself. That is why the method of handling the problem is so often different and yet so practical. The entire staff and the officers and directors of the Society are right in business up to their arm pits and have little time for "brain trust" theories or wide generalities. The activity must work, produce results, or stop.

For instance, take the ironer schools just completed in 29 cities and towns in northern California, which were conducted during the months of March, April, May and early June. They sprang from a reality. Too few salespeople knew how to use an ironer, let alone demonstrate one. And those who did know how made it look so complicated that it frightened the prospect back to the old ironing board. Bert Reynolds, promotional director of the Society, using just plain horse sense, argued that anybody could run a towel through an ironer, and if a shirt could be reduced to a few simple flat surfaces, there was no reason why anybody could not iron on an ironer. Neither was there any reason why it should look hard.

But the job was that of bringing this simple idea to enough salespeople to make the sale of ironers as simple as the ironing of a shirt. Accordingly both the educational directors of the Society, Bertha Mae Hixson and Gladys Byrne, each worked out a method for teaching small classes of not more than 11 salespeople at a time, in a series of three two-hour sessions. They taught not only enough about ironers to sell them simply and demonstrate them easily but to put the prospect down in the chair and have her iron a shirt successfully herself in a few seconds. And at the same time, the classes were to be given a simple yet convincing sales method of presenting the benefits to be derived from an ironer, which would enable anyone to sell any ironer he happened to carry on its customer advantages instead of individual gadgets or controversial features.

Briefly the schools were organized and operated as follows:

An announcement was sent to all dealers, together with a schedule of towns and dates for the schools. Pacific Gas and Electric Co. dealer representatives arranged for the location of the school, either at some large dealer's store or auditorium or the P. G. and E. building. Then they proceeded to enroll dealer sales people, the dealer or his wife in some instances. A temporary 3-conductor 120/240-volt service was run in to take care of a connected load of 18 kw. The energy was supplied free by the utility.

The educational director on arrival brought with her a special kit containing sections of 3 conductor cable and distribution boxes each with four convenience outlets. Dealers supplied their town brands of ironers so that there was one ironer for each one taking the course and one for the educational director.

With the ironers connected, the class enrolled, Miss Byrne, for instance, then proceeded on the following schedule for the first 2 hour lesson: first half hour, familiarize students with controls, each one doing some flat ironing. Next 45 minutes demonstrating how a shirt can be ironed quickly—each one learning by doing the "quick sales method" of ironing a shirt. Next 15 minutes, sug-

How to approach a prospect in the store and get her seated at the ironer is next illustrated. Once a customer is seated sales resistance is modified and the sale can be consummated sooner. (These pictures were taken at one of the three separate schools conducted at the auditorium of the Nathan-Dohrmann store in Stockton. Two other classes met there the same day at different hours. In these pictures are: W. C. Pettit, H. C. Shaw Co.; Fern Ruess, Stockton Dry Goods Co.; Thomas Nicholson, Stockton Fixture Co.; R. Angerina, Eddy Electric Co.; Mrs. Hazel Edburg, Turner Hardware Co.; George De Long, Burnham Bros. Furniture Co.; and William Clayton, Nathan Dohrmann Co.)

Practical instruction in pressing men's trousers and women's pleated skirts, steaming velvets, etc., given in one of the final lessons of the course. Students are reading aloud printed instructions as part of class training

The quick sales method of ironing a shirt was first taught. Gladys Byrne, educational director, and all students are handling the garment simultaneously in the same manner

gested technique for the demonstrator to use to interest a prospect in the store. Next 20 minutes, questions, discussion and practice. Last 10 minutes mimeographed copies of the outline of the lesson just completed were given out and explained.

In the second and third sessions a similar allocation of time was made to the instruction of how to iron other articles, prepare clothes for ironing, and how to press suits, etc. Again the entire group, men and women, having brought clothes to be ironed according to advance instructions, proceeded to learn how to use the ironer easily and quickly. Again each session had in it sales ammunition and selling ideas, and each one culminated with a mimeographed summary of the day's lesson.

For those who wished to learn to demonstrate and sell the G. E. flatplate ironer, or the Ironrite under-the-roll ironer, a separate session was held. Interestingly enough many who had finished the course took this additional instruction as well as that pertaining to their own ironers.

Two fundamental ideas were stressed. First the prospect must be seated comfortably at the ironer to do some ironing herself, and to see how easy and comfortably it could be done without standing. Second, the customer must be shown how much faster ironing can be done than by hand. Miss Byrne suggested a colored shirt be used to demonstrate with, since it contrasted better with the white roll of the ironer, and that all placement be "as flat as a towel." Fine points of ironing, she urged, should be shown the customer at her own home after purchase and after she had become proficient with simple ironing.

Most important point of the entire activity, though, should not be overlooked. Instead of just a few expert demonstrators to be sent to remote towns by distributors at dealers' request, and at considerable expense, there are now one or more salespeople in each electrical appliance dealer store throughout northern California who can show prospects how simple and easy it is to use an electric ironer. This means further that the huge investment in advertising and promotion to attract people to see an ironer will not be lost because of ignorance at the point of sale.

In view of the fact that seven out of eight owners of washers in the territory do not yet own an ironer, it is estimated that there are some 210,000 washer users who are prospects for ironers in northern California if this better trained sales crew will now put its newly acquired practice and knowledge of selling methods to work.

One of the many striking window displays each telling one point of the Frigidaire story

Whole Store Goes Over to Frigidaire

Declared to be the most spectacular refrigerator promotion ever conducted was that which Meyer & Frank, department store, staged to tie in with the visit to Portland of Alfred E. Sloane, president of General Motors. Every show window in the square block of store window space was devoted to Frigidaire window displays. The entire electrical department was turned over to Frigidaire display during the entire week. Sensational space in the newspapers also tied in with the event and sales for this make of refrigerator were reported to have succeeded all previous records.

This has been the first time that sheer overwhelming mass has been applied to a single electrical appliance promotion yet the results proved the effectiveness of this technique for those who can employ it. Window displays were simple and strong, in that each window took a single idea and hammered it home with a minimum of words and the directness of simplicity.

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• ITINERANT PEDDLERS are being discouraged in Salt Lake City by a joint campaign conducted by the merchants of that city. In a series of full-page ads eight-point warnings were issued to the housewives, business men and citizens of the region against the itinerant peddlers and establishing the authorized representatives of local business firms who carried identification and credentials. The campaign was sponsored by the "City Loyalty Assn." and has been found to have a salutary effect

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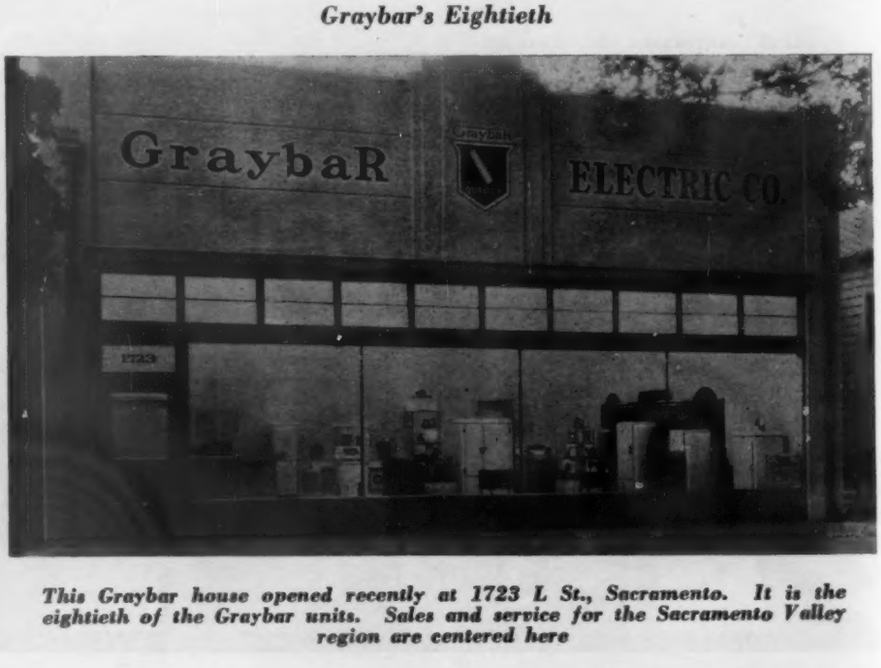
Graybar's Eightieth



This Graybar house opened recently at 1723 L St., Sacramento. It is the eightieth of the Graybar units. Sales and service for the Sacramento Valley region are centered here

Quality Attendance Marks San Jose Exposition

DOUBLE the amount of merchandise sold, and several times as many prospects secured from slightly less attendance than during previous years characterized the Spring Electrical Exposition of the Electrical Appliance Society of San Jose, held not long ago. This spelt a better grade of attendance, less of the riff-raff and school kid type, and distinguished the show by its class and its general level of achievement. Such, at least, is the resume just issued, summarizing the exposition and rendering a report to the 43 dealers and the Pacific Gas and Electric Co. who make up the Electric Appliance Society of San Jose and Santa Clara county.

Merchandise sold as a direct result of the show totalled $12,514, as against $7,700 in 1934, and $3,000 in 1932, at previous expositions. There were 554 good prospects secured, as against 169 and 442 for the respective previous years. Attendance was 13,000, in 1934 15,771, and in 1932 12,737. Appliances sold directly included 56 refrigerators, 5 electric ranges, 7 washing machines, 2 dishwashers, 3 ironers, 3 radios, 1 sewing machine and 1 mixer.

Purposes of the exposition were to bring new models to the attention of the public, to take advantage of the brand new civic auditorium completion and be the first commercial show in this splendid new structure, to follow up the end of F.H.A. financing terms with a stimulus to continued buying, to advertise the new lower rates and illustrate how savings can be applied to new electrical equipment, and to take advantage of the comparative freedom of the participating dealers at this season to give more attention to their displays and sales follow-up.

Participating in the show were the following firms: Curnow Appliance Co.; Dickerson Bros.; Farmers Union; L. Hart and Son Co., range and refrigerator, and washing machine departments; Hartman Bros., Ltd.; Koerber-Thompson, Inc.; L. Lion and Sons Co., household and music departments; McKenley-Glans Furniture Co.; Chas. A. Merritt and Son; Miller Household Appliance Co.; Mission Electric Co.; Nathan-Dohrmann Co.; San Jose Electric Co.; Schutte Bros.; University Electric Co.; and Western Pump Co., Ltd.

Committees, headed by president George M. Thompson of the Society were under the chairmanships of: Roy Butcher, general committee; Wm. C. Harvey, display and decorations; Roy Butcher, finance; Allyn Ferguson, entertainment; Dave Tuttle, prizes; P. M. Diederich, cake baking contest; A. M. Aiton, publicity; Jack Reeher, solicitation; and W. L. Greer, floor arrangement.

Above, a general view of the crowded floor during the last night of San Jose's successful electrical exposition. Below, the small children of one dealer, dressed in bathing suits, playing under sun lamps, who were somewhat of a hit all by themselves

Booths were of standard size, arranged along both sides and down the center of the large auditorium. These were rented to exhibitors and the money used to defray the cost of the auditorium and the central advertising. P. G. and E. Co. contributed a large share in the latter expense. Both local papers featured the exposition in advertising and publicity. Other publicity included letters to women's club members inviting participation in the cake baking contest, the proceeds from the sale of which were turned over to the Home of Benevolence.

Entertainment featured a cooking school conducted by Mrs. A. V. Farnsworth, home economist of P. G. and E. assisted by Rose McConlin. Attendance at the cooking school for the four days totalled 2,050. There were 123 cakes entered in the contest. Music during the evening was furnished by a symphony orchestra and singers.

As a result of the exposition several recommendations have been made in the report submitted by R. G. Van Gundy, secretary of the Society. Among these are that next year the entire civic auditorium building be rented instead of only the main hall, and thus provide more room for exhibitors, some firms having been unable to get space at this show. The cooking school would be held in the small theater which is a part of the auditorium, and the commercial, industrial and agricultural exhibits placed in another exhibit hall opposite the theater.

More elaborate entertainment plans are also suggested, and more dominant advertising display with follow-up ads during the show. Several novel electrical stunts are also suggested.

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Montana Power Drives on Electric Roasters

Closing up an "early bird" range and refrigerator campaign in June with 291 ranges and 527 refrigerators sold, Montana Power Co. launched a campaign on electric roasters during July, featuring the Westinghouse oval and de luxe model roasters.

More and more Montana Power Co. is broadening its program to encourage dealer participation and cooperation in its sales campaigns. Dealers will be acquainted with the details of this campaign and urged to tie in with it. Demonstrations are to be conducted on the floors of the offices of the company to which salesmen were urged to send their skeptical prospects. Besides summing up all of the sales features of roasters attractively, the feature of the campaign was to sell housewives cool kitchens during the summer months.

With its special inducements for gas water heaters abandoned at the end of June, electric water heaters again assumed importance in the sales picture in this territory.

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Night Cooking School Proves Successful

A night session featured a newspaper cooking school conducted in the Boise division of Idaho Power Co. and resulted in increased attendance. Called the "Electrical Housekeeping Institute" and sponsored by the Caldwell *News-Tribune*, one school was held early in June conducted by Alice Huckins, assisted by Dorothy Tolleth. The second school was held at Nampa and was sponsored by the Idaho *Free Press* and the Canyon County Granges. Miss Helen Dodge assisted Miss Tolleth in conducting the latter school.

Dealers' ranges and refrigerators were featured in both schools and a floor display of electrical equipment was part of the promotion. The night session was the first to be held and proved that a large attendance can be had at evening sessions, in some cases larger than those possible for day sessions.

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• CURTAIN RAISER, the sales campaign of the Puget Sound Power & Light Co., has resulted in the sale of 1,484 major units in eight weeks. Of 4,448 tips turned in by employees, 1,037 or 23.3 per cent resulted in sales.

Emphasizing the value of selling from a "fully dressed" refrigerator stocked with real food, Miss Hixson gave dealers selling hints

Prizes Offered Dealer Salesman in Campaign

DESPITE the stress on gadgets and individual features, the public is still interested to know why it should buy electric refrigerators based on its own fundamental needs for food saving, food preservation and the economy of quantity buying, declared Al Rice, sales manager, H. R. Basford Co., in the feature address of the third annual refrigeration dinner, San Francisco unit of the Electric Appliance Society, June 29. He also inspired his hearers with a picture of the future of refrigeration for the salesmen by pointing out that the field of application of temperature control to living conditions was only just being scratched at the present time.

The meeting was called to acquaint dealer sales personnel in San Francisco with the features of the campaign and to give them all the sales aids available to assist them in making it a success.

The 250 in attendance, consisting, in the main, of retail sales people from some 95 appliance sales organizations, enthusiastically received the short, concise presentation. A program of music and dances especially selected for the occasion provided plenty of entertainment during the dinner. The main program consisted of three parts.

First, the details and scope of the $10,000.00 electric refrigeration campaign of the present body were given by O. E. Rush, secretary of the San Francisco Unit. He also explained the rules and regulations governing the local tie-in effort of the San Francisco Unit itself, consisting of $275.00 in prize money for retail salesmen only whose organizations are members of the San Francisco Unit.

This prize money is to be distributed by a drawing after the campaign is over, each salesman to have one chance in this drawing for every bona fide refrigerator sale during the campaign at a retail price up to $150.00; two chances for every unit sale up to $250.00; three chances for every unit sale up to $350.00; and a maximum of four chances for any unit sale over $350.00.

The first prize is to consist of $75.00; second prize $50.00; next five prizes $10.00 each; and the next twenty $5.00 each.

The second part of the program consisted of a half-hour talk by Miss Bertha Mae Hixson, educational director of the Electric Appliance Society of Northern California, on how to sell refrigeration to the housewife. She had two refrigerators completely stocked with all types of food prepared during the day at a special school for demonstrators held at the same hotel. The demonstrators attending this school were present at the dinner, and were introduced by Guy Farwell, president of the San Francisco Unit, to the dealers present, with the suggestion that they were trained and available for use in the stores during the campaign period or thereafter if desired.

At a similar meeting in each division or district Miss Byrne likewise told of refrigerator sales points

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Test Proves Electric Cooking Is Fastest

ONCE and for all the question as to which is fastest, electricity or gas, was settled in public tests conducted in spectacular manner by Acme Electric Co. in the Farmers Market, Pasadena, Calif. E. D. Faeh, proprietor of the Farmers' Market home appliance store, known as Acme Electric Co., blazoned the results of the tests to the Pasadena public in full-page ads early in June.

Electricity boiled water faster than gas, winning by 6 min. 52 sec. under test conditions which were absolutely fair.

"Boiling water is recognized everywhere as the standard test for cooking speed. All water weighs the same—it boils at the same temperature. So given the same size container and an equal start, there is no argument about the results. Either electricity cooks faster than gas or it doesn't," said Mr. Faeh, and the result was that electricity cooks faster than any other fuel.

Three quarts of water were measured into two identical containers. Split-second stop watches recorded the time from a simultaneous start. Thirteen min. 10 1/5 sec. later the water over the large electric unit broke into a fast boil. Not until 6 min. 52 sec. more had elapsed did the container over the gas range reach the boiling point.

The tests were conducted on a brand new, modern, natural gas range and a new Hotpoint range using a Calrod heating unit. The test was also conducted on a smaller unit which also beat gas. The large unit was tested and found to consume 2,100 watts with a 7,172-B.t.u. capacity. The smaller unit tested at 1,200 watts with 4,098 B.t.u. capacity. The gas burner was rated at 9,000 B.t.u. capacity, an oversize burner designed for rapid heating. Water boiled on the 2,100-watt unit in 13 min. 10½ sec.; on the small electric unit in 19 min. 45 2/5 sec.; and on the large gas burner in 20 min. 2 1/5 sec.

With the large unit electric cooking proved to be 30 per cent faster than natural gas.

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Southern California League Predicts Increasing Sales

That the Southern California appliance mark has only reached a fraction of saturation, and that tremendous gains in appliance sales and load lie ahead were the enthusiastic conclusions of the Electrical Industry Rally recently held at the Los Angeles Electric Club under sponsorship of the Electrical Development League of Southern California.

George Belsey, chairman of the League's Sales Promotion Committee and head of the George Belsey Co., Ltd., pointed to the southern city's 1935 record of appliance sales, which placed the city sixth in the United States by volume. This year, he said, it so far is exceeded only by New York and Chicago.

Sales promotion, undertaken by the entire industry throughout the south, was cited by Mr. Belsey as the reason. Refrigerator advertising, he pointed out, was twice last year's figure during the first five months of this year, while sales had likewise doubled last year's total. He predicted sale of 100,000 units by the close of 1936.

Rousing the electrical man to use his own wares, and the means whereby this is being achieved, were described by Ross Hartley, president of The Electric Corp.

Speaking for branches of the industry were A. L. Stone, secretary- treasurer of the league, contractors; Armin Richter, president of the Southern California Retail Electric Assn., dealers; A. E. Hitchner, manufacturers, and Walter E. Coburn of the Electrical Maintenance Engineers Assn.

G. E. Road Show Wins Applause of Dealers

Acclaimed by dealers who have used it as being the most successful of General Electric's promotion aids, the "G. E. Road Show," which incorporates showing of the picture "Three Women" with three-day stands of the G. E. travelling kitchen, has been setting up sales records in northern California towns.

The dealer using the show advertises its arrival with poster and newspaper ads. To his prospects and friends he sends invitations to attend the free motion picture. The G. E. kitchen, carrying banners advertising the film, arrives in town the day before the showing.

As the audience enter the local theater used for the performance, they are given tickets on a prize drawing. Miss Lauretta La Marr, home economist, then opens the program with a short talk on modern kitchens. In addition to putting the audience in a friendly mood, this tends to focus their attention on electric-kitchen features of the film.

Shown prior to the feature "Three Women," are a cartoon and an F. H. A. news release dealing with building modernization. After the show, Miss La Marr invites everyone to visit the dealer, where demonstrations, menus and recipes, etc., are available.

From the prize coupons, which carried a questionnaire, it was determined that half those attending the shows have been actual prospects. In addition, the following interesting information was revealed:

Proportions of refrigeration use:	
Using electricity	1720
Using ice	1191
Having no refrigeration	428
Next appliance which prospect desires to purchase:	
Refrigerator	996
Range	439
Dishwashers	286
Clothes washer	241
Ironer	221
Water heater	52
Other appliances	167

The road show will continue to operate in Northern California this month. So far, R. Grosjean of General Electric Appliance, reports the following results:

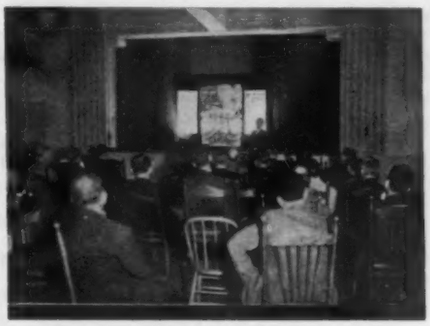
Town	Attendance	Prospects	Immed. Sales	Later Sales
Modesto	860	540	6	12
Sonora	110	162	3	5
	190			
Lodi	850	350	..	2
Stockton	400	211	2	4
Sacramento	540	320	5	8
Yuba City	380	267	5	8
Oroville	350	246	..	3
Red Bluff	200	134	2	4
Reno, Nev.	450	295	2	6
Westwood	425	282	4	5
Redding	460	305	3	8
Eureka	1000	573	2	N.R.
	560	280	2	N.R.
Arcata	500	345	1	N.R.
	200			
Willits	330	190	1	N.R.
Lakeport	170	101	..	N.R.
Healdsburg	400	206	1	N.R.
	8,375	4,807	40	65

N.R.—No report yet.

Opportunity Parade Tells Appliance Sales Chances

WITH a three-man traveling show, dealers in gas and electrical appliances throughout the system of Pacific Gas and Electric Co. were shown the opportunities awaiting them in the sale of gas and electrical appliances under the new low rate schedules recently effected by the company. Traveling a regular "one night stand" route which touched each of the divisions and nearly all of the districts of the company in northern and central California, the troupe consisting of Joe Gumz and Jerry Hill of the gas division and Rodney Doerr, lighting sales manager, who conducted the "Opportunity Parade for 1936."

In each instance the dealers were welcomed by the division or district sales manager. Mr. Gumz by means of



lantern illustrations and charts then showed the trend of rate reductions of the company and what this could mean in the extra use of gas and electricity by consumers at no extra cost. He then translated this into the operation of further appliances which dealers could sell. He also showed in spectacular fashion the differences in styling and features, as well as terms and costs of operation, between appliances in 1928 and in 1936. It was plainly pointed out that the selling appeal today was far greater than at any time in history, the prices lower and the terms easier and longer. This, he declared, spelt an unusual appliance sales opportunity for dealers.

Jerry Hill then told of the advertising program of the company which is backing up the sales of these appliances by dealers. He also told of special campaigns in which the company paid a third of the newspaper advertising of the dealers devoted exclusively to appliances.

Rodney Doerr usually closed the meeting with a strong inspirational talk telling how dealers can use these opportunities to improve their own business, volume and profit. He also illustrated how the public's buying ability had improved and inspired a stronger sales effort on the part of dealers to capitalize upon the opportunities of 1936.

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Plans Set to Sell Second Million I.E.S. Lamps

As part of the program to sell a million I.E.S. Better Sight lamps in October, the committee in charge has issued a complete plan book which is available to dealers and utilities. Announced is a national advertising campaign which will include 40,000,000 advertisements during the month.

All I.E.S. Better Sight lamp makers will offer "Second Birthday" specials representing the best values they can devise. These lamps will all carry a special blue and gold I.E.S. "Birthday Tag."

Merchandising and sales promotional plans featuring cooperation between utilities and retailers have been worked out. These include a "Second Birthday Sale," a "Matching-up" campaign and a "Trade-in" plan. Display material and mat services will be available for all three of these special merchandising promotions. A special booklet has been prepared for mailing in response to every inquiry from the magazine advertising. This booklet is available with the dealer or utility imprint at a price of $1.75 per 100. Complete details on the October campaign may be secured from any of the Better Sight I.E.S. lamp manufacturers, the Westinghouse Lamp Co. or the Incandescent Lamp Dept. of the General Electric Co.

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• STAR SALESMAN in a sales contest on electric laundry equipment in the states of Idaho, Utah and Wyoming was Bertram Emrich, of Weiser, Idaho, a member of the Globe Furniture Co. The contest was sponsored by General Electric Supply Corp. and 80 home laundry equipment salesmen competed.

G. E. Appliance Releases Wax Radio Program

A new note and an old note are struck simultaneously in a radio program on electric cookery announced by the Edison General Electric Appliance Co. Designed for local broadcast under the sponsorship of utilities and dealers, the program consists of thirteen records, each an independent 15-minute program.

The new note is the method, which affords excellent talent for local utilities and dealers who have previously been unable to build effective programs from material available in their communities.

The old note is in the music. "Songs That Will Never Grow Old" is the title of the program. Old favorites of universal appeal are sung by Harold Rick and Ralph Snyder, with Priscilla Holbrook at the piano. Harlow Wilcox announces. One general announcement of electric cookery, and one announcement on the Hotpoint range are the only interruptions to straight entertainment.

So. Calif. EDL Sponsors All-Electric Homes

Sponsorship of a series of ten moderately priced all-electric homes in various sections of southern California has been undertaken by The Electrical Development League. Architects' plans were completed first for the home located in Colfax Meadows in San Fernando Valley. It went on display last month and will be open for public demonstration for two months.

One principal feature of the first demonstration home was its price, $6,500, which includes an electric range, water heater, refrigerator, dishwasher and electric space heating. Purpose of this first home is to demonstrate to the public that the modern all-electric home is within the reach of the great middle class.

Each key dealer in the San Fernando Valley will be allotted one week to display all of his smaller appliances, thus presenting to the prospective buyers every type of electrical convenience which goes into a home. An advertising program is being perfected to attract large crowds.

Portland Utilities Withdraw Free Range Wiring

Free range wiring inaugurated in the Portland area March 18, 1935, to stimulate electric range sales was withdrawn by the Northwestern Electric Co. and the Portland General Electric Co. on August 1. During the time in which the offer was available to the public, 1,666 ranges were added to the lines of the Northwestern Electric Company and 3,872 to the lines of Pepco. Dealer range sales played an important part.

Announcement has been made by the two utilities that as a further manifestation of their desire to cooperate to the utmost with dealer outlets in range merchandising a new plan will soon be ready which will provide for financing of range wiring to be paid in easy installments by the customer.

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• GENERAL ELECTRIC CO. is constructing a model all-electric home at 6625 Adera Street, Vancouver. Outstanding features of the home will include G. E.'s most modern kitchen, new lighting fixtures and electric wiring, and air conditioning throughout.

DEALER SALES REPORTS—JUNE 1936

A Summary of Dealer Reports Compiled by Associations, Societies, Bureaus, or Dealer Contact Department of Utilities

APPLIANCE	P. G. & E. Co.[1]		San Diego Cons. G. & E. Co.[2]		San Joaquin Lt. & P. Corp.[3]		So. Calif. Edison Co., Ltd.[4]		Utah Power & Lt. Co.[5]		Wash. Water Power Co.[6]		Idaho Power Co.[7]	
	*June 1936	Year to date	June 1936	Year to date	June 1936	Year to date	June 1936	Year to date	‡May 1936	Year to date	June 1936	Year to date	June 1936	Year to date
Ranges	428	1,929	55	285	162	904	525	3,318	416	1,663	212	.....	335	2,620
Water Heaters	272	1,319	45	330	75	450	218	1,558	139	483	197	.....	249	1,511
Air Heaters—aux.	113	4,257	20	735	10	111	33	759	30	547	14	.....	2	174
Air Heaters, 220	73	430	.....	.....	48	351	.....	.....	.....	.....	.....	.....	.....	.....
Refrigerators	5,101	22,684	1,100	4,010	1,059	5,384	6,855	27,219	1,980	4,583	1,291	.....	1,247	3,907
Dishwashers	20	160	.....	.....	3	9	.....	.....	1	30	1	.....	3	19
Washers	2,807	17,444	475	1,980	445	2,629	2,989	17,277	1,191	5,106	631	.....	477	2,736
Ironers	812	5,508	70	435	87	532	580	3,552	41	253	51	.....	30	318
Vac. Cleaners	2,261	13,285	200	990	93	553	1,055	6,054	668	2,758	180	.....	112	652
Radios	5,626	47,052	850	5,475	578	3,548	4,447	26,764	967	6,019	854	.....	217	3,103
Mixers	567	6,370	125	895	76	458	379	2,331	972	2,286	163	.....	45	439
Cookers, Casseroles	.....	.....	70	290	17	88	77	422	29	81	743	.....	12	47
Irons	.....	.....	400	2,155	377	2,070	1,541	8,342	1,785	5,811	844	.....	384	2,104
Waffle Irons	.....	.....	150	1,065	110	663	440	2,578	488	2,205	163	.....	68	708
Toasters	.....	.....	175	1,110	122	818	652	3,384	659	3,067	528	.....	145	1,105
Table Stoves, etc.	.....	.....	35	260	227	905	339	1,649	1,591	5,596	183	.....	283	846
Heating Pads	.....	.....	35	745	12	197	65	1,139	95	914	52	.....	12	229
Curling Irons	.....	.....	.....	.....	.....	.....	38	293	243	1,314	.....	.....	.....	.....
Coffee Makers	.....	.....	225	1,300	97	610	372	2,107	619	2,089	561	.....	80	692
Sewing Machines	1,090	7,509	60	280	.....	.....	.....	.....	197	554	72	.....	22	92
Clocks	.....	.....	275	1,525	102	642	470	2,646	331	1,577	243	.....	29	239
Fans	.....	.....	.....	.....	809	1,073	959	1,350	635	963	595	.....	441	551
Floor Polishers	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sun Lamps	.....	.....	.....	.....	.....	.....	16	322	11	58	.....	.....	1	39
Reflector Lamps	.....	.....	.....	.....	104	642	.....	.....	704	5,256	430	.....	66	1,817
Misc. Lamps	.....	.....	.....	.....	.....	.....	.....	.....	824	3,995	911	.....	331	3,359
Yard Lights	.....	.....	.....	.....	58	258	.....	.....	.....	.....	.....	.....	.....	.....
Misc. Small Appl.	.....	.....	.....	.....	137	1,507	816	4,370	.....	.....	.....	.....	.....	.....
Total Dealers	1,400	.....	.....	.....	.....	.....	554	554	.....	.....	.....	.....	.....	.....
No. Reporting	.....	.....	.....	.....	138	148†	477	507†	.....	.....	.....	.....	.....	.....

[1] P. G. and E. reports obtained only on major appliances upon which accurate reports are available from dealers' accounts. Ranges, water heaters, and air heaters include company and dealer sales. Total dealers include gas as well as electric dealers. * Previous month's figures shown under current month's heading.

[2] Gathered by Bureau of Radio and Electric Appliances of San Diego County. Estimated monthly sales figures used in this table. Clocks, fans included under miscellaneous.

[3] Includes dealer reports from Midland Counties Public Service Corp. territory also. Compiled by Valley Electrical Supply Co.

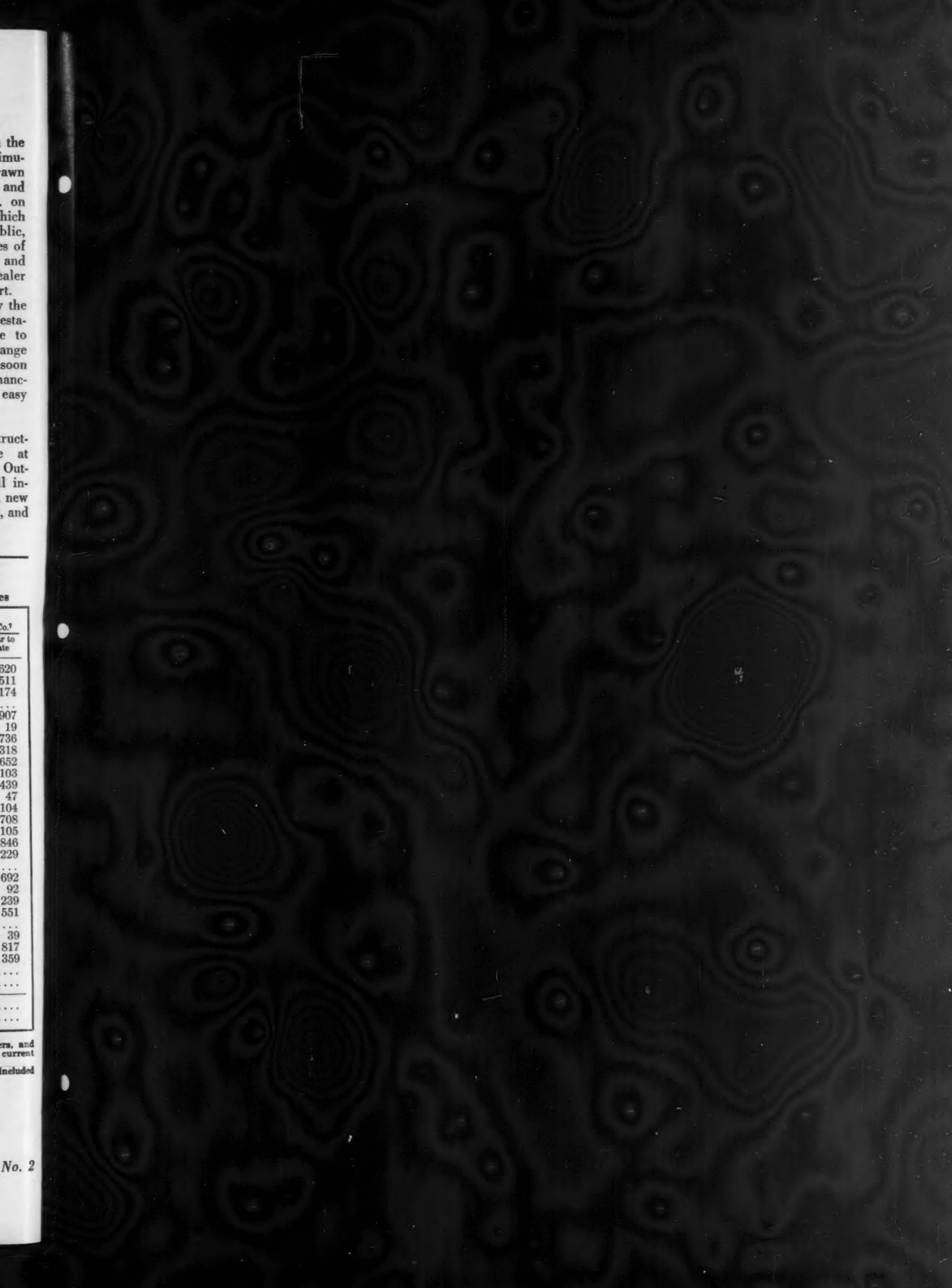
[4] Includes reports from dealers on San Joaquin Valley system of the company as well as Southern California areas served.

[5] Includes Utah Power & Light Co. territory in Utah, Idaho and Wyoming. Also Western Colorado Power Co. territory.

[6] Dealer sales only for Spokane and company's territory. Company sales not included. Table stoves, grills included with cookers.

[7] Figures compiled by Electrical Equipment Sales Association. Include power company sales and sales of all reporting dealers—about 60% report.

† Arithmetical average of number of dealers reporting. ‡ June report not available at time of going to press.



ELECTRICAL WEST COOPERATIVE

SALES APPLIANCE ★ GUIDE

RADIO

AUGUST, 1936

. . . . Copyright, 1936, by Electrical West, 883 Mission St., San Francisco

A separate "closing" or listening room is found effective by Saviers & Son, Reno, where prospects may try different sets themselves and where the salesman is undisturbed in his sales presentation by interruptions from the store. The combination helps to close more sales

Translate

the new features of your radio into improved pleasure from these favorite programs. For instance *high fidelity* is just highfalutin' language for "*you can pick out each individual instrument*", or "*just hear that bass singer; isn't it great to be able to hear him just the way he actually sings?*" Various trick tuning devices mean just one thing—*clear hearing of the program every time* without a lot of fussing with the dials. *Short wave* simply means the *ability to reach out farther* and pick a *wider variety* of entertainment and interest. It allows the one who is tired of local programs a chance to explore and bring home something he does like. It allows your *foreigner* prospect to *listen to his homeland* in his own language—more pleasure and thrill.

Trade-ins—

Many dealers solve their trade-in problem by selling strongly the idea that every home needs more than one set. (See list in an adjoining column of other places a radio can be used.) One department store advertised it would give all traded-in radios to a local charity and induced many deferred prospects to buy then instead of waiting.

In Advertising—

remember that radio essentially is "show business". So *be a good showman.* Take advantage of special broadcasts and events.

Even a small floor space can be arranged to provide a radio corner or department in a dealer's store, as Clinnick Electric Co., Oakland, finds. Note the chairs for comfortable seating of the prospect, and the clever way many portables are displayed on stepped shelves on the rear wall

Learn Your Customer's Likes

and You'll Sell More Radio Sets Today

RADIO isn't novel any more. It has become commonplace, and to some people even a nuisance. To sell radio in the face of the high saturation of sets that still work reasonably well takes a more skillful job of selling today. Yet salesmen and dealers who learn to look at radio through their customer's eyes still sell and sell aplenty, and earn commissions and profits. It is well to clear your mind of technical jargon and trade talk and think of what it is the customer *wants* or might be made to want from a radio. If you can supply these *wants* easily and satisfactorily you will bring *pleasure* and *happiness* to him that will be worth the investment of his money in a new set.

Tactful Questions

will sound out just what type of program he or she likes. "Some folks like opera, some folks sing flat", so find out whether they like opera, symphony, dance music, sports, hillbillies, home economy talks, politics, plays like "One Man's Family", or comedians like Eddie Cantor. Then show them *how* and *when* they can get their favorite type of program. Some smart dealers make up mimeographed lists of each type of program to assist customers to find them quickly.

More Than One Set

can be sold to every home. Here are a few reasons why your prospect should buy more than one. Suggest these and help your sale along. Create mental pictures of how they can get enjoyment and real interest out of their radio every moment. Sell a set for the—

Kitchen—so that the lady of the house may not miss her favorite programs while getting meals or washing dishes. Takes the curse out of housekeeping to be entertained while doing chores. She can get recipes and housekeeping or beauty hints in this way too.

Children—so that their favorite programs will not interfere with those the grownups would prefer to hear at the same time. Saves family arguments over which program will be heard.

Bedroom—so that a background of music can be heard while enjoying reading in bed, or a sleepless night relieved by something of interest while resting in bed, or so that a convalescent may be amused without much attention from mother or nurse.

Guest Room—so that guests may feel free to keep up with favorite programs or serials that may not interest the family. They feel more at home and appreciate this thoughtful hospitality.

Rumpus Room—so that the regular family set need not be moved when entertaining. Children can entertain their friends at home instead of going out to night clubs, etc.

Laundry or Workshop—so that work will be made to seem easier while being entertained.

●

Note how Bill Smith, the master salesman, uses these ideas to sell a second, portable set in the enclosed Sales Talk.

SALES TALKS THAT

CASE HISTORY NO. 21 . . . . . SELLING A RADIO

● TOO FEW electrical dealers capitalize to the fullest advantage upon the goodwill they have built up through past service. After all, satisfied customers are the best prospect list obtainable. They can be canvassed quickly and economically by telephone and this method of arousing interest in a new item is effective if it is used judiciously.

Bill knows that most of his customers have a good radio so he plans a fall campaign to sell many of his prospects a second set. To do this, he has stocked a new table model radio, one that is modest in price, handsome in appearance and incorporating the modern features which have made older sets obsolete, yet light enough to be carried easily.

Any number of methods could be used to get prospects into the store. Bill used the telephone to invite Mrs. Brown to drop in and see the new models. Here is his sales talk—prepared to convince her of the advisability of having two radios in her home.

BILL: "How do you do, Mrs. Brown. It is very kind of you to stop by. I asked you because I know you are interested in having your home comfortable and enjoyable. That's why I wanted you to see these exceptional new radios that add hours of new thrills and enjoyment for your family."

BILL wants to get interest fast and he does it by a tactful compliment to his prospect's interest in the comfort of her family and suggesting that his new radio can add to it.

MRS. BROWN: "It was nice of you to think of us but I just stepped in to tell you that we already have a good radio that gets all of the stations we listen to regularly. After your call I mentioned a new radio to my husband, and he said that our model is plenty good enough for the time being."

BILL: "I confess that I knew you had a very fine radio and I wouldn't have suggested a new one except that many families have found that a second portable set more than doubles the enjoyment they get out of radio. Unless you have tried it you can't realize how much extra pleasure and companionship is built into these fine table models. Take it with you on automobile trips to the beach or mountains, move it with you around the house—your kitchen in the morning and your bedroom at night. When guests come or when the football broadcasts conflict with other programs, this inexpensive instrument really proves its value. The modern household needs two radios as much as it needs two automobiles."

MRS. BROWN: "Yes, I suppose that's true but it seems to me that we don't use our present set overly much and I don't think we'd get enough use out of another set to make it worth while."

THIS "turndown" is just the lead a good salesman wants. It gives him an opportunity to prove to the prospect that the value and quality of his product are worth more to her than the price.

BILL: "I agree that it is difficult to visualize the usefulness of a second radio in your home until you realize the great improvements that have been made both in radio receivers and in broadcasting itself. Not only have the manufacturing and broadcasting companies made it possible to bring every program into your home with greater fidelity than ever before but also they have made available for your enjoyment hundreds more programs than ever before—programs of a variety that defies description. In addition to the regular broadcast band this new set has three shortwave

Sold APPLIANCES

dials which will provide thrilling hours of exploration for the family. It will bring you the marvelous programs from foreign stations that you would never hear otherwise—police, amateur and airplane calls and lots of other fascinating broadcasts."

MRS. BROWN: "It would be nice to take advantage of those things but don't you think that shortwave reception is just a fad? I think most people just listen to the local stations. Most of the good programs reach us through them anyway."

BILL: "That's quite true, Mrs. Brown, but don't you think that most people listen to the local stations because their radios don't bring in any others satisfactorily? I feel assured that shortwave is here to stay because it is the answer to the public's demand for more variety and quality from radio. Your local stations can broadcast only a limited number of programs daily. Shortwave makes the world your local station and places at your command the finest talent available. You may prefer only certain types of programs and this new, modern radio enables you to make selections from the finest available anywhere. For instance, I feel sure that your husband would thoroughly enjoy receiving the broadcast of the Olympic Games direct from the stadium in Berlin this summer, and that is only one of hundreds of interesting events of the world that these new sets bring right into your home."

MRS. BROWN *(doubtfully)*: "But isn't it difficult to operate with all these different dials, etc.?"

BILL: "It's as easy as 'tuning' in with your present set. These new designs are all but automatic. For instance, this little light indicates when the station is being received at its maximum signal strength. Modern design has made these sets very selective too. They have to be to bring in so many more distance stations without interference. The automatic volume control corrects any atmospheric changes that you speak of as 'fading.' Indeed these models all but think for themselves. All you have to do is to turn the pointer to the station you want to receive, whether it is here or in the Orient, the set does the rest. Why not let me send his table model out today. I know that the whole family will be enthusiastic about its performance and that you'll soon begin to wonder how you ever got along without one."

MRS. BROWN: "I don't think we want to put the money in one just now. Perhaps later on.

BILL: "Of course, you are the best judge of that, Mrs. Brown, but I hope I can persuade you to decide to do it now. Summer is almost over and the fall season of entertainment from the air soon will be in full swing. The most exciting event will be the presidential election. It's going to be close and shortwave reception will put you at the critical spots in the campaign. Then there are the Olympic Games, concerts, opera, important news events, and a thousand and one other programs that can be yours. In fact, there will be so much to choose from that your family will find that two sets are almost indispensable if everyone is going to enjoy the maximum pleasure out of radio. Perhaps you yourself are not interested particularly in the distant or foreign programs made available by shortwave, but you will find that the children, and most likely your husband too, will spend many happy hours experimenting with this new feature. You, I think, will appreciate most the fine musical qualities of the set, for it really is a quality musical instrument that will bring in a program with amazing fidelity. You will notice the improvement which has been made since your old set was built the first time you listen to its reproduction of symphony, opera or other fine music. Its remarkable performance will please you just as it will the rest of the family. Don't you agree that it would be wise to give your family the advantages and enjoyment that this modern set provides?"

MRS. BROWN: "I suppose it would be, but I really hadn't budgeted anything for a new radio this year."

BILL *(smiling)*: "I know how it is with budgets because we try to keep one too. But why not look upon this purchase as entertainment? Just think, you can give the family their choice of the finest programs in the world for the cost of one or two shows a month for the rest of the year! I'm sure that we can arrange terms that will be convenient. May I send this out today?"

MRS. BROWN: "Yes, I guess you might as well."

THREE important things should be noted about Bill's sales talk. First, he has interpreted the new radio in hours of pleasure and enjoyment for the prospect and her family. Second, he DID NOT resort to the jargon of the trade that the average person doesn't understand and which confuses rather than enlightens the prospect. Third, Bill kept selling after the prospect said "no" three different times, and he finally got the order. Notable also is Bill's tactful use of compliment to hold his prospect's interest during the presentation.

CALIFORNIA OREGON POWER CO. • PORTLAND GENERAL ELECTRIC CO.
MOUNTAIN STATES POWER CO. • PUGET SOUND POWER & LIGHT CO.
PACIFIC POWER & LIGHT CO. • IDAHO POWER CO.
NORTHWESTERN ELECTRIC CO. • WASHINGTON WATER POWER CO.
UTAH POWER & LIGHT CO.

Speak Your Customer's Language

and You'll Sell Radio on What it Means to Him

Beautiful Piece of Furniture

Modern styling and careful cabinet work have made all modern radios things of beauty that fit into any home setting. To the woman this means much. Stress radio cabinet beauty, and how it will enhance each home.

World's Talent at No Cost

Brought to the home, where they may be listened to in home comfort, are the world's finest artists, funniest comedians, most important speakers. Modern sets bring greater fidelity of tone and hence greater realism as to actual presence of these people right in the home. Even if the set is used only for these special features, it more than pays for itself in money saved and time spent going to hear such talent, to say nothing of the opportunity to do so.

Complete Variety of Choice

Ability to tap all wave bands brings not only choice of local and chain broadcasts but international events, as well as the dramatic human interest of police calls, airplane signals, ship calls—the real life drama that is so much more vital than fiction. Lack of programs desired on local air lanes does not limit choice since distance can be explored for the kind desired. *"Reach out for better programs."*

Good Company

Lonesomeness is banished by the companionship of a radio. Routine tasks are done quickly and without boredom while being entertained by radio. When far away from cities and diversions, either as a permanent resident or on a trip, radio keeps one in touch with affairs and wipes out distance.

News Summary that Saves Time

News flashes and time signals keep one informed at no expense of personal effort, and save detailed reading until a leisure moment. Never out of touch with the march of events.

Service to radios can be one of the best sources of new business, so many dealers maintain an excellent service department. Late hour and holiday service brings one dealer special business passed up by his competitors, and hence more leads. He volunteers a free service call on former customers every three months, and especially at the termination of a contract. Besides obtaining all the tube business, he gets other service business and the first crack at any other appliance the customer requires

Valuable Information and Education

Health lectures by physicians of repute, talks by experts of all kinds, university programs, educational lectures, farm information, interpretations of world events by experienced commentators, and other informative and educational services are available by radio.

Atmosphere helps sales by good showmanship, as Poole Electric Co., Seattle, has found with its distinctive Indian totem room on a mezzanine floor, where prospects can be taken away from store distractions to try several makes of radio of a comparable price range and select the particular tone quality they prefer. The room also makes a fine sales crew meeting room

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Auto Radio

Take Favorite Programs With You

No need to stay at home so as not to miss a favorite feature program, football game, or concert. You can be driving out in the country, shopping with the wife around town, on a business trip, or just traveling and your programs stay with you. At a picnic you bring music. On a camping trip you keep in touch with the world for news or entertainment.

Company on a Lonesome Drive

The dreariness of a long trip is relieved by the entertainment, news, time signals, and even some of the programs you always considered "goofy". Likewise the tendency to drive too fast in order to get somewhere quickly for companionship is eliminated with a radio in the car. You can't read while driving, but the news comes to you just the same.

Isn't it Romantic

Music while driving at sunset, by moonlight, through a beautiful scenic region, or with the right company, brings romance and beauty to the interior of an automobile.

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Save these Sales Guides in a folder. They appear in ELECTRICAL WEST *each month. In September will appear the all-appliance master Sales Guide of the Year. Do not fail to get and retain your copy for year 'round use and profit.*

Phonograph Combination

(A phenomenal increase in phonograph record sales indicates that there is a growing market for both records and electric phonographs, or combination radio phonographs, or just electric pick-ups and turntables. This makes a fine plus business for the dealer, and records keep customers coming back for more purchases. Below are customer reasons for buying a combination set, which should be used in selling the idea of the purchase of such versatile instruments.)

Your Own Choice of Program

Many people like special kinds of music, or a special piece. They want to hear it when they are ready to listen, and like to repeat it if they feel like it. This is possible with a radio-phonograph. Often it is not convenient to listen to a program. With a phonograph you suit your own convenience. There is no advertising to distract from complete enjoyment. Singers long since dead can still be heard.

Recorded Music Better Balanced

No reputable maker of records turns one out that is not technically right. There is more rehearsal, and better placing of instruments with respect to the microphone, and hence better tone balance in recordings. Electrical transcription brings the greatest possible realism to the tone.

Freedom from Static

Summer daytimes in warm climates bring static to even the best of radios, but records are free from it. Clear, undisturbed and undistorted music every time.

Select a Whole Program

With automatic record changing models an entire series of records can be selected and will play continuously during dinner, a dance, or an evening of bridge, or for a quiet background of music. without talking. announcing or advertising. With remote loudspeaker connections the same program may be heard in the garden or in other rooms of the house. Ideal for entertaining.

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Engineering Symposium + + +

[A monthly forum in which engineers will present and discuss their problems, this department is dedicated to advancing the art of power generation, transmission, distribution and utilization]

Distribution Planning Coordinates System Growth With Substation Capacities*

By H. H. MINOR

Distribution Engineer, San Joaquin Light and Power Corp.

AT TIMES, coupled with maintaining correct voltage for the utilization equipment on our rural lines, is the problem of coordinating the loads with the supplying substation capacity. In many cases our distribution systems, originally planned as local radial systems fed from a centrally located substation, become virtual networks supplied from several substations. As loads increase and additional territory is developed the distribution lines are extended until two or more local radial systems lap. Radial feeders are inter-connected and become tie-lines between two substations. Two-way supply becomes possible.

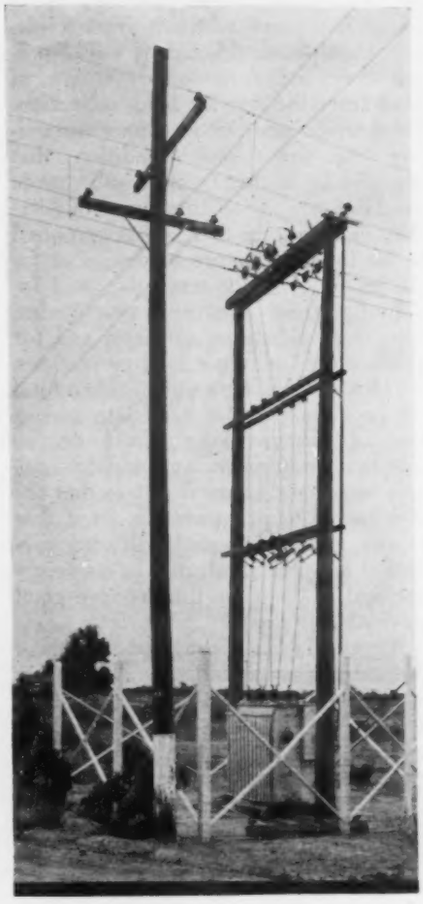
In most cases, the original radial lines having been constructed solely with the idea of supplying load from one source only, their capacity from a voltage drop standpoint is not very great and, unless the expensive expedient of increasing copper size throughout their entire length is employed, they are not serviceable for transfer of load from one substation to another. They may be so utilized in cases of emergency but poor voltage regulation will result.

It is extremely difficult to foresee the trend of load growth. An unexpected development in a certain area may suddenly increase loads, or unforeseen difficulties in another area may retard growth. No matter how carefully a system may be planned the condition of one substation being heavily loaded and an adjoining one having considerable space capacity is quite common.

The problem thus prescribed for solution is: Can load be transferred from the heavily burdened substation to the other, or is it advisable to provide additional capacity at the former? In other words, is the heavily loaded substation serving too large an area and the other one not enough?

Immediately the question of distribution line capacity and routing presents itself. The problem is complicated (1) by the probable general increase in load which may justify a new substation midway between the existing ones, (2) by the transmission system capacity and the location of its lines and its probable future design, and (3) by availability of major substation equipment such as transformers, circuit breakers, etc. The final answer may be evident, but the time may not be ripe to carry out the plan. The immediate need may require a solution that will be more or less temporary in nature, but it must tie in with the future plans.

This step-type regulator with a 7½ per cent permanent "boost" solved a difficult distribution problem with a minimum of investment



Such problems require more than simple distribution planning. They involve system planning, and the correct result is the one which will provide adequate service for the least capital expenditure and, at the same time, with a minimum operating or maintenance cost. Temporary expedients may be required, but such measures must be carefully considered with a picture of the future always in mind. If distribution lines are reinforced to make them serve as tie lines, thought must be given to possible over-adequacy in the future. If new feeders are constructed they must be so routed and of such design that they will be correct for the eventual distribution. If substation capacity is added thought should be given to its future need at that location.

Most rural distribution just grew as did Topsy. Many extension rules, based on cost of extension allowed as a function of estimated revenue from the load to be served, resulted in small capacity lines. As these lines were extended to outlying loads and as demand increased on the existing line, customers at the end of these radial feeders—those located on the fringe of the distribution or midway between two substations, suffered from fluctuating voltage. If these lines were eventually so interconnected as to provide a tie between two substations, the same low voltage

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* This is the third and last of the series on Distribution Planning by Mr. Minor. Like the preceding two, this article shows what can be accomplished in distribution engineering to the end of obtaining better service for the customer and lowered costs for the utility. This article discusses the problems incident to load growth and voltage regulation in rural areas. Readers who would like to review Mr. Minor's previous articles will find them as follows:

"Feeder Regulation Permits Service to Varied Loads," Pages 40-42, March 1936, ELECTRICAL WEST.

"Distribution Planning Saves $200,000 Investment," Pages 26-27, May 1936, ELECTRICAL WEST.

would result for the midway customers. There would be very little chance of transfer of load over such a line.

Conditions, such as described above, in a territory serving a scattered load, of which agricultural pumping predominates, recently became acute at two locations. The first of these involved a low voltage area about midway between two substations. It is served from a substation where there is ample reserve capacity. The feeder supplying the load is constructed of No. 2 copper and extends 5½ miles from its source to a point where it divides into two main branches. No load is served from this circuit along this 5½-mile distance, another feeder along that route caring for the intervening load. One of these main branches may be connected to a second substation through sectionalizing line switches but over a long route. The other branch may be tied to a circuit supplied by this same adjacent substation by building 1 mile of line. Replacing some 3 miles of small copper with No. 2 will then provide a tie between the two substations of No. 2 wire throughout, over as short a route as is possible.

This second substation is fully loaded and recent increases in business call for relief or for the provision of additional capacity. It is logical that some load should be shifted from this fully loaded substation to the one with spare capacity. To do so, however, and at the same time provide satisfactory voltage to the customers who might be so transferred, will require more line capacity than is available or can be made available by the completion of the No. 2 tie just mentioned. Voltage conditions during the agricultural pumping peak are bad now. This load "comes on" all at once and resort to distribution transformer tap-changing is necessary. It goes off more gradually and taps have to be again changed, usually in two steps. Voltage conditions have to be watched very closely as, although agricultural pumping is the predominant load and the one that causes the peak, there is quite an amount of residential load in the same area. To add load to any of the lines connecting these two substations, in order that it be shifted from the heavily loaded one to the other, would make a bad voltage condition worse.

Considering the whole picture, however, such reconstruction of or additions to the existing distribution network between the two substations involved, is by far the most economical solution of the problem. Some such construction would be necessary even if additional capacity were available at the substation now loaded. The load involved will probably not justify a third substation at any time in the future such as would obviate the steps now necessary to correct the bad voltage condition which exists in the area midway between the two existing stations.

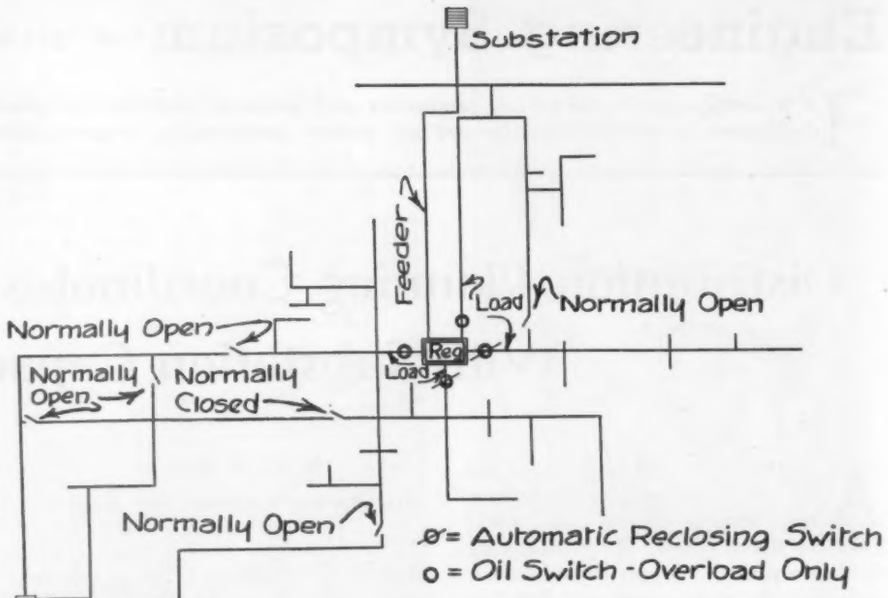


Diagram of circuits serving the territory described in the article. The step-type regulator permitted a more equitable distribution in load between substations and improved the voltage service to all customers in the vicinity

Provision of the No. 2 tie between the two substations as described above would not prove adequate from a voltage standpoint, although it would permit the transfer of some 800 kw. of load from the heavily load substation. To provide additional copper to correct the low-voltage condition that would exist if that transfer were made would cost in the neighborhood of $40,000. The voltage that will be supplied is the limiting feature of design of facilities to correctly serve the load involved. From a capacity standpoint, from a consideration of losses and for availability for future load corrections, the No. 2 line is ample. Therefore, the problem revolves itself into correction of voltage along that feeder so that the condition at the midpoint area will be properly served and so that the 800 kw. of load beyond the point that is now supplied from the loaded substation may be transferred to its neighbor and at the same time receive good service.

Bus regulation is provided at each of the substations involved. As feeders of different characteristics are supplied, it is not practicable to employ line drop compensation, at least to any great extent, and a uniform bus voltage results. Thus any voltage correction for the feeder under consideration will require a "boost" instead of a "buck". As stated above, this feeder supplies no load for the initial 5½ miles of its length. Thus that distance may be considered as a sort of sub-transmission line and be utilized as a supply circuit to a regulating station at its end. Furthermore, it so happens that only power loads are or probably will be supplied for some 3 miles further on either of the branches of this feeder. Thus a slight over-voltage along that distance would not be objectionable. Consequently a step-voltage regulator located at the 5½-mile point provided with line drop compensation for an additional 3 miles would be satisfactory and in effect would move the point of constant voltage from the substation bus out on the line some 8½ miles.

As "raise" only is normally required, such a regulator should have a fixed boost included. Such equipment is available in almost any combination desired. For the feeder being considered a regulator with a 5-per cent fixed boost and a 7½-per cent raise or lower regulating winding was decided upon. This results in a total range of 15 per cent, 2½ per cent lower and 12½ per cent raise. The load on this feeder with the inclusion of the 800 kw. to be transferred will approximate 1,800 kw. at 85 per cent power factor. This will result in approximately 8.5 per cent drop over the feeder to the regulator. From that point, 1,300 kw. will be served over the branch to be reconstructed in

order to allow for the load transfer. This load for 3 mi. will result in 3.5 per cent drop. Therefore, at full load the regulator will be required to provide an outgoing voltage 12 per cent higher than its supply in order to maintain substation bus voltage 8½ mi. out on the line. That is just within the limits of the regulator decided upon.

This point of compensation is not far from the low-voltage area to which reference has been made. The 800-kw. load to be transferred is 8 miles beyond that point. At full load its voltage will be approximately 4 per cent below that at the point of compensation. In other words, if the regulator is set to maintain 12,000 volts at the 8½-mi. point, the full-load voltage at the regulator will be 12,420 volts, and, at the extreme load to be transferred, it will be 11,520 volts. The fluctuation between no load and full load will be a maximum of 4 per cent at any point on the feeder that is supplying load.

For a long rural feeder this is very satisfactory regulation. To arrive at that same result, that is a maximum fluctuation of 4 per cent from substation bus voltage, by providing copper would require four such circuits as the one considered here or two additional 1/0 circuits. Utilizing existing poles where available would make the cost of these two 1/0 circuits in excess of $40,000. The cost of the regulator installed and the reconstruction of the existing line to provide the No. 2 wire tie between the two substations is $11,000.

The expenditure of this sum will correct the bad voltage condition in the area served and will allow of transfer of enough load to the station having available capacity to postpone for at least a year any addition to the other substation. If it were deemed advisable to make that addition so that the transfer of load considered here were not required it would still be necessary to correct the low-voltage condition that exists. To do that would require an additional feeder of 1/0 copper to the area in trouble as well as to reinforce the present feeder to No. 2. The cost of this would be at least double the cost of the regulator installation described above.

Thus the solution of this problem as outlined will not only care for the poor service conditions now existing and thereby obviate the yearly operating expense of changing distribution transformer taps (as well as provide very good voltage to all the load served) but it also will allow postponement of major capital expenditure for an increase of substation facilities. It will do this at a cost of less than half the amount that would be required to correct the low voltage conditions only by increasing the feeder serving the present loads.

The second case mentioned above does not involve a transfer of load but does allow the postponement of the construction of an additional substation. An area that has had a very rapid load growth and is situated at some distance from the supply to the 12-kv. distribution has reached the point where voltage conditions call for remedy. Some years ago a 1/0 feeder was built to this area on account of their existing voltage difficulty which proved adequate for some time. Continued increase of demand, however, has again resulted in voltage trouble during peak periods. In this area there is quite a large domestic load served which is generally distributed over the whole area. Thus relatively close voltage regulation is very desirable.

Eventually plans call for a substation in this area, at which time the 1/0 feeder mentioned above would serve as a tie between this new substation and the one now serving the territory. The construction of this substation will involve quite an extensive transmission line building program which should be delayed if possible. It was contemplated that, in lieu of this complete substation and its transmission, only the 12-kv. distribution structures and regulating equipment should be installed. The 1/0 line would be used as a supply to this resulting switching and regulating station. Some uncertainty exists, however, as to the most logical location for the contemplated substation in order to fit into the transmission development that may be finally chosen. Therefore, a more temporary measure, but one that would correct the existing voltage difficulty and adequately care for service to the area in trouble for some time seems advisable.

Again, the use of the relatively inexpensive and easily installed step-voltage regulator was decided upon. The one to be used will be identical with the one described above. That is it will be a 100-amp., 13,200-volt regulator with a 5 per cent fixed boost and a 7½ per cent raise and lower regulating winding, resulting in 2½ per cent lower and 12½ per cent raise of the voltage supplied to it. It will be installed at a distance of 8 mi. from the substation now serving the area in difficulty at the end of the 1/0 feeder mentioned. This location will probably be that decided upon for the permanent substation, but if another site is decided upon very little expense will be incurred because of moving this equipment.

From this location present feeders branch in from all directions. The territory served is mostly made up of small vineyards, orchards, or other types of farm. While the predominating load is agricultural pumping there is a large domestic load as well. Voltage must be held within close limits. The various feeders diverging from this proposed regulator station serve loads of like characteristics so that some line drop compensation may be employed.

In order to care for the loads adjacent to the 1/0 line mentioned above, which is to be utilized as the supply line to the regulator station, some 4 mi. of "feed back" line will have to be built on the same poles carrying the 1/0 line. To this "feed back" will be connected those loads now supplied by the 1/0 line and it will tie into other existing circuits which are part of the distribution network that serves this territory.

The regulator station itself will be very simple. A wood pole "A"-frame will support the necessary disconnects and by-pass switch necessary to isolate the regulator when required. Feeder circuit breakers of the pole-top, series-trip type will be installed on separate line poles in each outgoing feeder. Two of these will be a recently developed automatic re-closing circuit breaker, or circuit restorer as it is called.

The resulting voltage should be excellent over the whole territory involved. The cost of the whole installation is estimated at somewhat less than $12,000. The necessity for a transmission line and substation will be postponed for a long time unless some unforeseen change in load conditions arises. If this does happen the equipment used is almost 100 per cent salvageable. The "feed back" would be required if a sub were built. Very little additional maintenance cost has been added; only that pertaining to some 4 mi. of distribution feeder, and the regulating station being new. From experience with step-voltage regulators, it is expected that such maintenance will be extremely small.

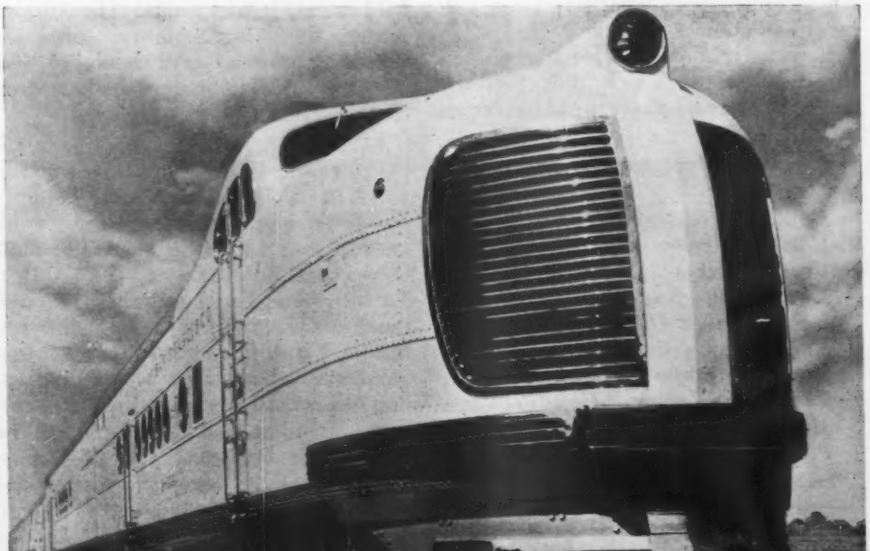
Thus have two problems in distribution planning for rural areas been solved. Nothing unusual confronted

Capital Investments in Substation Capacity and Distribution Copper Postponed by Equalizing Substation Loading Through Use of Step-type Regulators and Intelligent Re-arrangement of Existing Feeders. Voltage Conditions Materially Improved by Planned Expansion Program

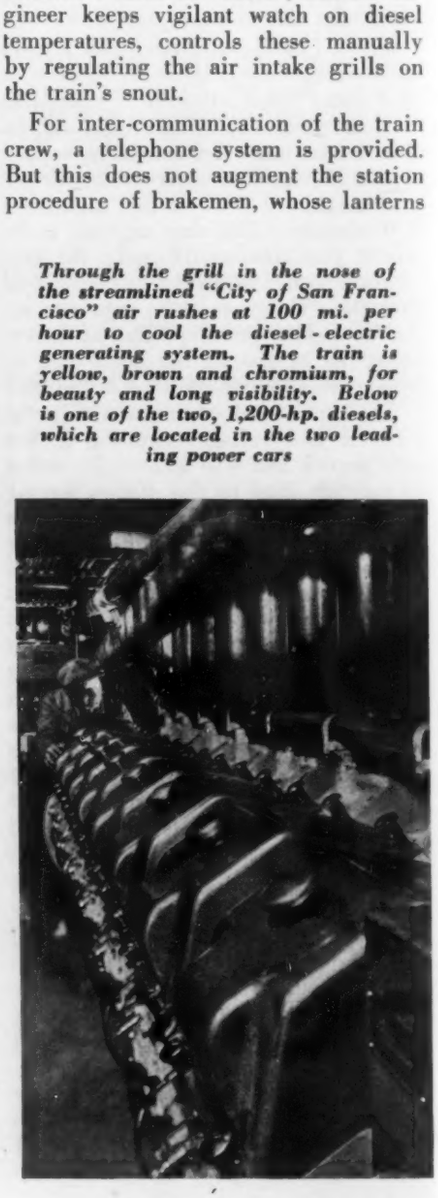
the distribution engineer, nor was anything done in solving them that is outstanding. Advantage was taken of existing conditions and apparatus and modern equipment and methods used to improve a bad situation for a small capital outlay.

Earlier papers of this series on Distribution Planning dealt with more or less unusual installations. First, the addition of a large industrial load along a long radial feeder which was serving other loads was discussed. The time element was involved and proper voltage regulation the major problem. Second, the means that were taken to provide adequate service over an extremely long distribution feeder was described. Again voltage regulation was the principal part of the problem. The installations briefly outlined in this article result in part from the need of better voltage regulation.

Correct voltage is of prime importance in supplying the kind of service to which the customer is entitled. To furnish that service and at the same time keep installation and operating costs as low as possible is a major duty of the distribution engineer. Careful analysis of the problems involved is necessary and proper application of modern methods and equipment must be made if the correct solution is to be obtained. The day of haphazard, rule of thumb methods has passed. Distribution must be intelligently engineered.



Through the grill in the nose of the streamlined "City of San Francisco" air rushes at 100 mi. per hour to cool the diesel-electric generating system. The train is yellow, brown and chromium, for beauty and long visibility. Below is one of the two, 1,200-hp. diesels, which are located in the two leading power cars



Western Railroads Set New Pace

A ROVING power plant of 2,400 hp., carrying along its own load of motors, toasters, lights, cookers and air-conditioners moved into the South Pacific Coast region last month at 100 miles per hour.

This was the Southern Pacific Railroad's streamlined, diesel-electric train, "City of San Francisco," bringing Chicago 19 hours closer to the Pacific Coast and giving several Southwestern states their first super-speed rail service.

Shortly before, "The City of Los Angeles," a practically identical train, but of 2,100 hp., began service to the Southern city over Union Pacific lines, effecting a similar reduction in scheduled time.

Power is generated in the two leading units, which are steel built, and separable from the nine-car, aluminum, articulated section of baggage cars, pullmans and coaches. Prime movers, within these power units, are two 16-cylinder, V-type, 1,200-hp. diesels, direct connected to 700-volt, d.c., General Electric generators at 750 r.p.m.

These supply power for the eight, 350-volt motors, geared to the trucks of the power units at a ratio of 52:19. Auxiliary power is furnished through two generators, driven by separate diesels, and rated at 75 kw., 220 volts, 3 phase, 60 cycles. Main load on these are the air-conditioning units, but 110-volt service is taken out for lighting, bell circuits, electric utensils and radios.

Air-conditioning units are 6-ton Frigidaires, two units per car in coaches, sleepers and diner-lounge. The train carries four Pullmans, one coach, one combination coach-buffet, dining-lounge car, kitchen-dormitory-baggage car and mail-baggage-express car. Pastel blue interiors emphasize the cool airiness. Indirect lighting is installed.

Miscellaneous features include: length, 725 ft.; weight, 500 tons, half that of equivalent conventional train; passenger capacity, 170, 84 in sleepers, 86 in coaches; maximum speed, in excess of 100 mi. per hr.; cost, about $1,150,000.

The engineer sits high and forward in the leading power unit, viewing the track through a windshield much like that of an automobile, even to the wiper. Automatic controls protect against the possibility of human failure. Two men constitute the engine crew. Firing and feedwater tasks are absent, but the engineer keeps vigilant watch on diesel temperatures, controls these manually by regulating the air intake grills on the train's snout.

For inter-communication of the train crew, a telephone system is provided. But this does not augment the station procedure of brakemen, whose lanterns

may be seen twinkling down the train's sleek length when it makes one of its rare pauses in its night flight across the Western continent.

An electrical job on the right-of-way was occasioned by the new trains' schedules. Circuits to automatic highway-crossing signals were extended by the Southern Pacific up to 1,500 ft., to give ample warning of a 100-mi. per hr. approach.

Although complete data on the economies of these electrically propelled trains await experience through their operation, company officials foresee low fuel consumption and low maintenance on the basis of the performance of other, similar units. But the "City of Los Angeles" and the "City of San Francisco" have already proved their speed, and through electricity, rail time from the Pacific Coast to Chicago is cut to an unprecedented 39¾ hours.

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Automatic Radio Transmitter Simplifies Stream Gaging

ACCURATE records of stream flow are highly important in the West where hydro-electric power generation, irrigation, domestic water supplies and other important services are dependent upon the variations in runoff. However, the maintenance of such stream records is liable to involve excessive costs because critical plants on most streams are generally remotely located and require either periodic visits of a man to read the gages or the maintenance of telephone lines connected to some form of automatic recording device. To provide a more reliable and less expensive method of obtaining stream flow readings, Irvin and Ingerson, associate hydraulic engineers, Department of Public Works, State of California, have perfected an automatic radio transmitter operating in conjunction with a stream height recorder which transmits readings at predetermined intervals without errors, delays and regardless of weather conditions.

The apparatus keeps the state engineer's office in constant touch with the great central river system of California, transmitting twelve daily readings from ten important stream gaging stations at remote points automatically.

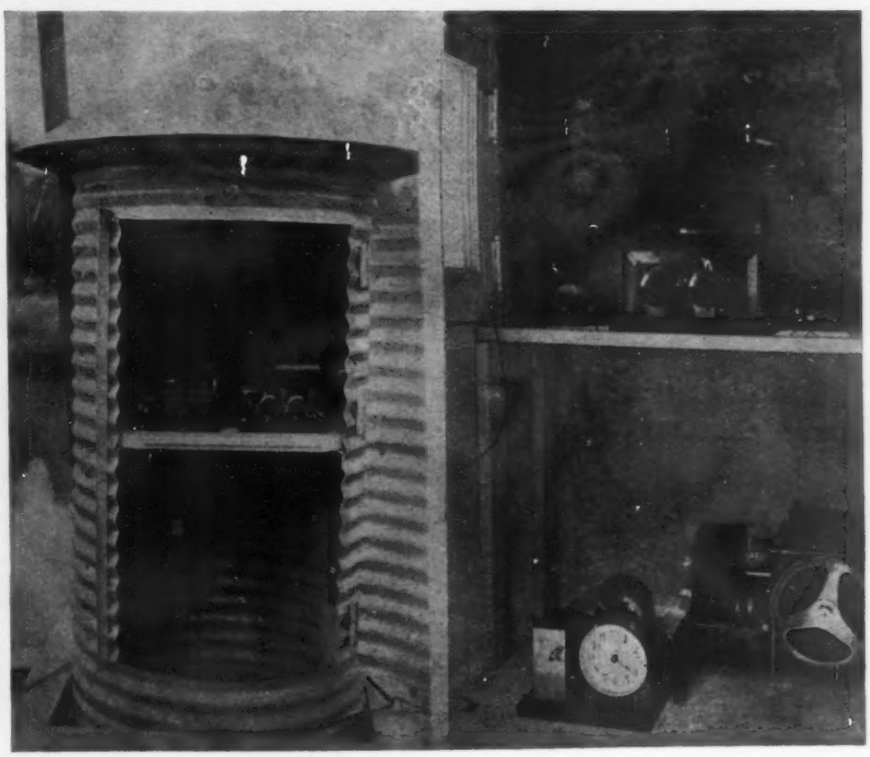
The apparatus is built for a maximum of simplicity and reliability and is extremely compact. Essentially, it consists of two devices, the keying device which sets up a code signal according to the height of the stream and the transmitter.

The keying device makes the whole plan possible. This is an ingenious application of the commutation motion derived from a falling weight geared through a time clock. The clock has three functions, namely, that of keeping time, of operating the time switches and operating the special commutator which connects the radio transmitter to give a series of short dashes indicating the gage stream height at the moment. The cross weight averages 17 lbs., graphs approximately 1 ft. per day.

Electrically connected to the crosscut commutator is the float commutator which is actuated by means of the usual float and counterweight on a cable passing over a 1-ft. circumference pulley. The float changes position with changes in height of water. This motion moves a rotating selector drum equipped with three steps of ten segments and fingers which converts the stream height into radio impulses. The three steps of ten segments provide for readings of three significant figures in gage height, making it possible to read in units, tenths or hundredths of a foot depending upon the maximum variation in water level.

The transmitter has a minimum power requirement and, because there is no source of central station power, dry batteries provide the energy. Two-volt filament radio tubes with one tube or two tubes in parallel are used. The frequency of oscillation is controlled by a quartz crystal, four radio channels between 2,516 and 2,844 kilocycles having been assigned for the stream gaging radio installation. Reliable operation can be expected during the day for a distance of 100 miles.

The float commutator sets up the code circuit corresponding to the gage height which, when connected by means of the clock to the transmitter, transmits a reading consisting of a series of short dashes in pure CW radiation. In addition to the gage height readings, the keying device automatically sends out an identifying call code. The switching arrangement can be adjusted to energize the transmitter at 2-, 4-, 6- and 12-hour intervals and the length of each transmission period can be varied from 5 to 45 min., the signals being repeated



Left — The automatic stream gaging radio transmitter mounted in a station showing the falling weight which energizes the clock. Right— The complete equipment necessary for the automatic radio stream gage transmitter itself and below the clock and commutator segments and the float commutator

continuously during the period when the transmitter is energized. Any short wave receiver capable of receiving from 110 to 130-meter unmodulated CW signals can be used to receive the signals.

A set of dry cells costing $3 will last approximately 2 months on a 2-hr. schedule and correspondingly longer on schedules of greater intervals. A set of "B" batteries costing $10 will last 4 to 6 months. With relatively low first costs and minimum operating costs, a radio stream gaging installation has materially cut down the cost of administration of water master works and at the same time gives accurate and more frequent information than could be obtained in any other way. During a 2-year period of operation, the sets have proven unusually reliable.

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Electric Shock Studies Clarify Heart Behavior Under Stress

Strangely, though shock to animal life was one of the first electric phenomena to be given experimental attention, it has been among the last to be clarified by accumulation of experimental evidence. But this year, after decades during which data gravitated to the record of electrical utilization, four men presented to the American Institute of Electrical Engineers a paper setting forth the findings of long, careful investigations on the "Effect of Electric Shock on the Heart."

These men were L. P. Ferris and P. W. Spence, both of Bell Telephone Laboratories, Inc., and B. G. King and H. B. Williams, both of Columbia University, where the investigation was initiated at the College of Physicians and Surgeons in 1927.

The study was aimed to provide definite information that might be translated to man, particularly in defining the limits of dangerous shock and as a basis for the development of protective measures and practices.

Subjects for the tests were animals under anesthesia, varying in size from guinea pigs to calves. Current was supplied at 208 volts, 60 cycles, with voltage raised by a variable ratio autotransformer, giving 30-volt steps up to 3,000 volts. A solenoid oil switch and timing relay were used to control shock applications. Electrocardiograms of each animal before and after shock, together with the shock current and voltage, were recorded on photographic film by means of a special 3-string electromagnetic oscillograph.

An electrocardiogram is a graphical record of the time variation of the voltage that always is associated with the action of the heart, taken between electrodes placed on chosen points of the body. Cardiac voltages are of the order of one millivolt, in this test amplified by vacuum tube giving a maximum output of 100 milliampere.

Extremely small magnitudes of current passing through the body cannot be felt. As current increases to 0.9 milliamperes, it reaches the threshold of perception. Still greater currents arrest muscular action. But just beyond this point, it was discovered, current applied for so short a time as to make the interruption of muscular action irrelevant, will cause death.

What this current does is cause ventricular fibrillation, a disruption of normal heart activity. Ordinarily the muscles of the heart are working together, in synchronism. When fibrillation occurs, heart muscle fibers contract in uncoordinated asynchronism, in contrast to their normal coordinated rhythm.

Since current causing fibrillation was found roughly to vary according to heart weight and body weight of the animals, results could be interpreted in terms of the weights for man. On this basis it was reported:

"The results on the whole indicate that currents in excess of 0.1 ampere at 60 cycles from hand to foot would be dangerous for shock durations of 3 seconds or more."

This, the threshold current for fibrillation, the maximum to which man safely may be subjected, varies with five factors:

1. Specie and size of animal.
2. Current pathway. Between arms gives threshold current somewhat higher than from arm to leg. Leg to leg currents may rise to 15 amperes, with fibrillation not liable to result.
3. Frequency. The 25 cycle threshold current is about 25 per cent higher than the 60 cycle value, and the d.c. about 5 times the 60 cycle value, except for shocks lasting but a small fraction of a second.
4. Time of shock occurrence in relation to cardiac cycle. The heart is most sensitive during 20 per cent, the partial refractory period, of its cycle.
5. Duration of shock. An inverse but non-uniform relation exists between threshold current and duration. During the heart's sensitive phase, threshold current for 0.1-sec. duration or less is 10 or more times the threshold for 1 sec. or more.

Other conclusions were: successive shocks have no cumulative effect on susceptibility to fibrillation; susceptibility through short shocks increases with current up to several times the threshold, then diminishes.

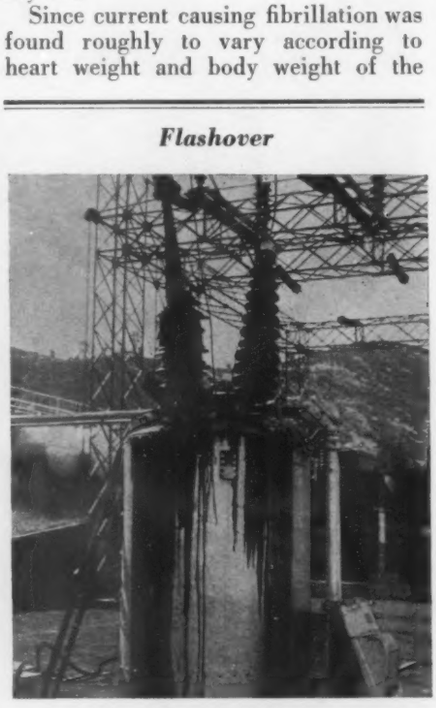
In regard to treatment of shock, the report observed that suggested methods in no way diminish the necessity for maintaining respiration, by artificial means if necessary. Respiration maintains slight circulation, assisting in heart nutrition and delaying brain degeneration.

Counter electric shock of high intensity met with 60 per cent success in recovering animals comparable in size with man from fibrillation. To be successful, it must be administered promptly, probably within a few minutes.

The shocks used were arbitrarily chosen, and determination of the best counter shock conditions awaits further investigation. However, it was found that the liability of causing fibrillation through mistakenly applied counter shock is small, and should fibrillation occur, it could probably be checked by a second counter-shock.

Current rather than voltage was found to be the best criterion of shock conditions because of the wide range of contact conditions affecting the actual voltage drop through the body.

Flashover



This is what happens when 220-kv. arcs across a circuit breaker bushing. The station crew, even though high in the mountains, placed the breaker back in operation in a few hours—it's "just part of the job"

Engineering Reading . . .

RELAY SYSTEMS, by I. R. Monseth and P. H. Robinson, 549 pages, fabricoid bound, published by McGraw-Hill Book Co., price $6.00. For sale by McGraw-Hill retail room, 883 Mission St., San Francisco. As a basis for the theory and application of relay systems the authors have presented a practical system of fault calculations for all arrangements of system connections and all types of short circuits. Upon thorough quantitative analysis of the magnitude and relations of currents and voltages, the authors contend, lies the only foundation for progress in relay system applications. Included are relay application data on recent developments in high-speed relaying of the distance, balance, differential, pilot-wire and carrier-current types.

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ELECTRIC ELEVATORS, by F. A. Annett, second edition, 495 pages, fabricoid bound, published by McGraw-Hill Book Co., price $5.00. For sale by McGraw-Hill Retail room, 883 Mission St., San Francisco. Published in first edition at a time when unprecedented office building was under way, this volume now includes 200 pages of new material covering developments and changes in practice growing out of experience with these structures. The book covers design, construction, operation and maintenance. New chapters include treatment of micro-leveling signal control, car-switch operation with automatic landing, car- and hoistway-door operators, signal systems and selection of elevators. A chapter has been added on double-deck-car elevators and two elevators operating in one hoistway.

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GENERATING STATIONS, second edition, by Alfred H. Lovell, M.Sc., 438 pages, fabricoid bound, price $4.50. Published by the McGraw-Hill Book Co. For sale by the McGraw-Hill Retail Room, 883 Mission St., San Francisco. Exhaustion of the first edition led to the second edition of this exceedingly comprehensive treatment of economic elements of electrical design of generating stations. Covering its field from elementary principals of corporate finance through application of the most recent developments in equipment, the book includes coverage of such new influences in station design as the mercury vapor-steam cycle; epoch making Federal construction projects; new high voltages in transmission, and the growing importance of domestic loads.

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HANDBOOK OF CHEMISTRY AND PHYSICS, Twentieth Edition, has again been revised and supplemented with much new material. It is published by the Chemical Rubber Co., and edited by Charles C. Hodgman, M.S.; contains 1966 pages of tables and data valuable to anyone having to do with physical or chemical apparatus, calculation, or reference. A particular feature is a new table of physical constants of organic compounds prepared by Dr. Austin M. Patterson, a leading authority in the field of nomenclature. Other features are a formula index of organic compounds, a list of chemical words and their pronounciation, rules for naming organic compounds, prefix names of organic radicals, properties of the amino acids (prepared, by the way, by Dr. Max S. Dun, University of California, at Los Angeles), and data on X-Ray spectra. Also included is a new table on magnetic-optic rotation and an enlarged section on colorimetry, all of which are of interest to illuminating engineers. The book retails for $6.00.

Lifesavers

These 8-ft. high slabs of concrete, poured by the Salt River Valley Water Users Assn. in steel poles of their 2,300-volt distribution system, prevented children and others from climbing the pole lacings, and thus ended a series of fatalities. Cost per pole was $2.786 for the first 1,200, estimated $2.25 for 4,800

AMERICAN ELECTRICIANS' HANDBOOK — By Terrell Croft; fourth edition; revised by Clifford C. Carr, E.E. Leatherette binding; 1,051 pages, thin media paper; profusely illustrated with diagrams, charts and tables. Price $4. Available from Book Depository, McGraw-Hill Book Co., 883 Mission St., San Francisco. Changes made necessary by the revisions of the National Electrical Code, 1935 edition, have been incorporated in the newest edition of this indispensable handbook for wiremen and electricians. A valuable dictionary and encyclopedia of electrical information for the wireman and electrician is contained in this compact pocket-size volume. Treatment throughout is predominantly practical and useable. An elaborate and complete cross index brings ready reference to the many thousand items in the volume.

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PHOTO-ELECTRIC AND SELENIUM CELLS—Edited by T. J. Fielding. Fabricoid bound; 5½ x 7 in.; 146 pages; illustrated. For sale by Instruments Publishing Co., Pittsburgh, Pa. Price $1.75.

This book covers the construction and use of light-sensitive cells and stresses their practical operation and application. The material is complete, well illustrated and should prove helpful to the designer or manufacturer of these devices as well as to amateur experimenters.

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INDUCTIVE COORDINATION by Laurence Jay Corbett, consulting electrical engineer, San Francisco. Price $3.00. For sale at the J. H. Neblett Press Rooms, Ltd., 500 Sansome St., San Francisco, Calif. This book, one of the first complete works on the subject of inductive coordination, presents the factors involved in the consideration of inductive coordination problems and remedial methods by which detrimental effects can be nullified. The data not only represent the extensive experience in the subject by the author but also a comprehensive summary of important contemporary literature on the subject. An excellent bibliography on the subject is contained in the book. Important also is the original work of the author represented in the two chapters on the flow and control of residual currents in power systems. Laborious formulae have been kept at a minimum and liberal use of illustrations facilitates the presentation of a highly technical subject.

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THE SYMPOSIUM ON ILLUMINATION, edited by J. W. Griebeson, D.S.C. M.A., and published by the Instrument Publishing Co., Pittsburgh, Pa. Retail price, $4.50. The lectures, of which the book is a reprint, were given as a course under the auspices of the National Illumination Committee of Great Britain, and the I.E.S., in 1933. Each chapter is a transcription of one of the lectures, revised in order to facilitate publication.

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THE NATIONAL ELECTRICAL CODE HANDBOOK, third edition, by Arthur L. Abbott, published by McGraw-Hill Book Co., Inc., price $3, fabricoid bound. For sale by McGraw-Hill Retail Room, 883 Mission St., San Francisco.

Revised to conform with the latest edition of the National Electrical Code, this third edition of Mr. Abbott's book contains all of the valuable features of the previous editions. Its intent is to make more readily accessible and understandable the rules and regulations of the code requirements, to illustrate methods of installation which conform with the intent of the code and to give discussion pertinent to the theory back of each of the rules. It is a helpful reference book to all practical users of the code among engineers, contractors and wiremen, as well as an excellent text book for classes taking up study of electrical construction practice.

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RADIO RECEIVING AND TELEVISION TUBES, by James A. Mayer and John F. Wostrel. 635 pages, illustrated, 5½x8 in., price $4. Published by the McGraw-Hill Book Co. For sale by the McGraw-Hill Retail Room, 883 Mission St., San Francisco. Bringing up to date the second edition, published in 1931, this book combines the consideration of fundamentals with the comprehensive treatment of the most recent developments in radio receiving and television tubes. An entire chapter is devoted to television tubes and another chapter to industrial applications of vacuum tubes. The introduction into practical design of all-metal tubes and tubes with five, six or more elements is treated in detail. Written for both students and seasoned engineers, the book is a source for knowledge of fundamental characteristics and new industrial applications.

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HOME OWNERS HAND BOOK, published by Housing Publications, Inc., 25 West 43rd St., New York, is a new paper bound book placed on newsstands for general sale and distribution. It provides the home owners of America with an easily understood guide to the repair or remodeling of an old home or the construction of a new one and includes data on correct lighting, wiring and use of electricity and electrical appliances. It has a chapter dealing with "The Efficient Kitchen," suggesting lighting, outlets, information about hot water heaters, washers, ranges, motor driven appliances and refrigerators. A feature is a listing by the editors under various categories of the trade names and brief specifications of standard products, together with names and addresses of manufacturers. This is done without respect to advertising. It will be of interest to manufacturers of appliances and devices not listed to see that they are named in future listings as the book is to be revised from time to time.

With the Trade Associations + + +

[An Exchange of Plans and Ideas for Assisting the Industry in All Branches to Solve Some of Its Problems of Trade Relations and Business Ethics]

The Other Fellow

By CLYDE L. CHAMBLIN
President San Francisco Electrical Contractors Assn., Inc.,; Past President N. E. C. A. and California Electragists

At the time the second contractor appeared on the scene to compete for work, the "Other Fellow" was born.

The number of "Other Fellows" is determined by the number of competitors, not by the size of their bank accounts or by the size of the jobs taken. The "Other Fellow" is a slick operator. He says he will do one thing and then he goes out and does something else. Sometimes he does not say in so many words that he will do a certain thing, but he lets the impression prevail that he will, and then his conscience is clear for he can deny he ever agreed to any such proposition when confronted with an apparent violation of his word. He is selfish and greedy. He always has an "in." He delights in breaking down the regular channels of distribution. He uses the same methods in buying he is trying to prevent the general contractor from using.

This is the "Other Fellow."

"While here I am willing to cooperate, ready to go 51% of the way to give the Other Fellow a break. I would not think of taking the 'extras' on the Other Fellow's job, and I always figure my honest overhead and profit, and refuse any job where I cannot get it. Of course you understand that I have to protect myself. If I have done a couple of jobs for a customer, I have to protect my interests even if I lose money on one job to keep my standing with my customer. I may have to meet the figure of the Other Fellow who butted in, even if he was invited.

"Then of course you know how it is when you have been trying for a long time to get in with some architect or general contractor and are always high, so they say. You may have to shade a bit just to get a start. I am sure you know how that is and appreciate it is not my regular policy. Then again there are times when I have given some architect or owner some valuable suggestions as to how to specify the job, and they really want me to do his job, but they have to take other figures. Knowing the Other Fellow as I do, what can I do but be sure I am low enough to be in line? I don't want to do these things but that damned Other Fellow compels me to. I think, By George, there ought to be a law that would compel these Other Fellows to play square.

"If the Union would refuse to work for these fellows and the wholesalers would not sell them, we could clean up this situation in a hurry. If they did this, however, I would not be able to handle all the business and I suppose some of these sharpshooters would find a way around it. I guess I will have to do like the rest of them if I want to keep in the picture, but I know I can't make any money if I do.

"Maybe I can make a special deal with some wholesale house, so that if I give them all my business I might get a special price. I think that is a fair deal. One hundred per cent of my business ought to be worth something. Where's my hat? . . . I think I'll go out and see what I can do. . . ."

Who Is The Other Fellow?

The foregoing may sound silly, but alas, it is the actual working of far too many minds in the contracting field to be funny. Years of experience seem to count for little, for the old-timer does exactly the same as the last graduate journeyman who inherited a $500 fortune and started out to be a big operator. Why presumably intelligent men will think for one minute that they can out-smart the other fellow and continue to get away with it, is hard to understand.

The crying need in all business is for sportsmanship, and unselfishness. The "wise guy", the "egotist", the "stander inner", the "inside buyer", the "lone wolf" is the fellow against whom the industry should gang up.

Is it not possible to get our sporting blood aroused to the extent that we can get our industry to sign up in the "51 Per Cent Club"? No, dear sir, not to try to get 51% of the available business, but to go 51% of the way in any deal to see that no transaction is closed without someone getting a legitimate profit.

With this kind of competition, every one would be sure to get his turn sooner or later, and the whole morale of the industry would be raised. Is it not time to stop living in the future, to the extent that we take the job today at or below cost in the hope that tomorrow we will be able to make it up?

Dollars like minutes once lost are never made up. Follow the record of any contractor and point to one who has made anything more than a skimpy living by taking jobs regardless of cost. The only answer he can give is the threadbare song, "The Other Fellow".

Another silly cause of price cutting is our willingness to believe in everyone but our competitor. A bid taker who gives a legitimate preference to a contractor is naturally embarrassed to admit he has given more money for the job than the low bidder submitted. His easiest out is, "I had a lower figure". That always closes any argument. And how we swallow it.

Without giving our competitor any chance to tell his story, we jump to conclusions and away we go, spreading the unfair story that So and So is a price cutter or worse. They say Americans are the best sports in the world, but by the great horn spoon, all the real sports seem to go into other businesses than contracting.

Raise Our Sights

Why not raise our sights and make a fresh start. We have all been hard pressed and worried. Perhaps this has warped our faith in humanity. But now with things looking better, rather than worse, let's stiffen our backs and renew our faith in humanity. At least in those with whom we must rise or fall. A pledge something like this would revolutionize the contracting industry:

Recognizing we all make mistakes, including myself, I will not repeat any detrimental story about a competitor without first contacting him and hearing his side of the story.

In my attempt to close business I will not make a statement or use an argument that I am not perfectly willing my competitor should use.

I will be constructive and not destructive in my relations with my Industry.

Special Discounts Outlawed By Robinson-Patman Bill

JUST what the Robinson-Patman Price Discrimination Bill, passed June 11 and signed by the President June 20, will do to electrical sales control have yet to be determined. However, its effect is far reaching in possibilities and will doubtless affect not only dealers but contractors, wholesalers and manufacturers of electrical appliances, wiring supplies and other equipment.

Summarized by *Business Week*, the bill "would require a seller to extend to all customers who buy from him in the same quantities the same net prices on goods of the same kind and quality, unless differentials in discounts can be justified on the basis of different selling, transportation, or manufacturing costs.

"In its general aspects this is the same objective which was written into the existing Clayton Act 22 years ago. But the broad provisions of the Clayton Act have proved unenforceable; the big mass distributors have been able to secure discounts, commissions, and allowances on their bulk orders which old-line middlemen have contended were tantamount to price discriminations against them and their customers. This situation led to the pending Patman amendment which seeks to define price discrimination on more detailed and narrow grounds and to couch the prohibitions against it in much more emphatic and realistic language.

THE BILL PROVIDES

"1. That price discrimination as generally stated above is unlawful.

"2. That the Federal Trade Commission may fix quantity limits where it finds purchasers in greater quantities are so few as to render discounts unjustly discriminatory.

"3. That price changes if made in good faith may be quoted where changing conditions affect marketability of the goods.

"4. That when proof of discrimination is offered the burden of rebuttal rests on the accused.

"5. That adjustments may be made to 'meet an equally low price of a competitor, or the services or facilities furnished by a competitor.' (The Clayton Act authorizes price reductions 'to meet competition.' Considerable emphasis during House debate was laid on the necessity for providing that such reductions should go as low but no lower than those of a competitor.)

NO COMMISSIONS ALLOWED

"6. That no commission, allowance, brokerage, compensation, or anything of value shall be paid over and above open discounts to any customer or his agent, direct or indirect.

"7. That all service allowances (advertising) must be offered on proportionately equal terms to all buyers.

"8. That all special terms and facilities must be offered on proportionately equal terms.

"9. That the *buyer* as well as the seller is liable under the Act.

"10. That all orders and actions of the Federal Trade Commission issued under the old Clayton Act (notably the case of Goodyear and Sears, Roebuck) shall be held in statu quo.

LOSS-LEADERS HIT

"11. That no 'unreasonably low' price to destroy competition shall be quoted. (This is hopefully aimed at loss-leader retail selling—presumably an intrastate function.)

"12. That the savings dividends of cooperative associations of all types shall be exempt.

"13. That violation is punishable by a $5,000 fine or one year's imprisonment."

It will be seen that these provisions affect discriminatory discounts on wiring supplies for a contract job as well as quantity discrimination on appliances to large outlets such as chain stores and mail order houses.

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Inspectors Plan Convention Programs

Both the Northwestern and Southwestern Sections of the International Assn. of Electrical Inspectors are busy preparing plans for their annual conventions in September. The Northwestern Section meeting is to be held at the Olympia Hotel, Olympia, Wash., Sept. 14 to 16. That of the Southwestern Section will be held at Hotel Fresno, Fresno, Calif., Sept. 21 to 23.

At the present time none of the discussion program features have been completely arranged so that announcement of them must wait until the next issue. However, committees on entertainment are busy at both sections and are planning inspection tours and trips for the ladies, banquets and other arrangements of that kind.

The Northwestern Section contemplates a golf tournament, a trip to Cushman Dam, a clam bake and a trip through Washington state capitol and the Olympic Brewing Co. plant at Tumwater. The ladies have planned for them a theater party and a bridge party. R. J. Larrabee, field engineer, Underwriters' Laboratories, will have the Underwriters' portable laboratory on hand for demonstrating how field tests of wire are being conducted.

At the Fresno meeting one of the features will be a joint luncheon with the Contractors' Assn. on Sept. 21, with a theater party that same afternoon for the ladies. On Tuesday, Sept. 22, a tour of General Grant and Sequoia National Parks is planned for the ladies and the men will make a tour of various local industries including wineries, raisin plants and airport. That evening the annual banquet and dance will be held at the hotel.

A tentative outline of the business program at each convention has been promised by the secretaries of each section respectively for the next issue.

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Southern California Sub Contractors Organize

Complete organization of an "Employers' Conference of Building Trades Associations" in southern California was recently announced by F. C. Schilling, Jr., president of the Merchant Plumbers' Assn., Inc., who is president of the Employers' Conference. Membership in the organization is confined to subcontractors' associations. The following groups are affiliated: Merchant Plumbers' Assn., Inc., Electrical Contractors' Assn., Contracting Plasterers' Assn., of Los Angeles, Mason Contractors' Exchange, Painting and Decorating Contractors' Assn. of Los Angeles, Inc., and Associated Gun Contractors of the Pacific Coast. Purpose of the organization is to further the welfare of subcontractors and to cooperate with other groups in the building business for the general advancement of the construction industry. Its formation is an outgrowth of the need for coordination of these various crafts which was discovered under the NRA code regime.

Officers of the Employers' Conference are as follows: F. C. Schilling, Jr., president (president, Merchant Plumbers' Assn., Inc.); C. S. Taylor, vice-president (director, Electrical Contractors' Assn.); B. A. Fallgren, treasurer (director, Contracting Plasterers' Assn. of Los Angeles); Donald R. Wadle, secretary (secretary, Contracting Plasterers' Assn. of Los Angeles) and as directors: J. A. Powers (director, Mason Contractors' Exchange) and C. J. Klaas (Painting and Decorating Contractors' Assn. of Los Angeles, Inc.). Headquarters are maintained at 564 Chamber of Commerce Bldg., Los Angeles.

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• HUSBANDS WHO allow their wives to stand while ironing escape the law in Wisconsin. But employers who follow this procedure in the State suffer heavy penalties. This paradox in the prevention of cruelty recently was pointed out by Edward N. Hurley, Jr., president of the Hurley Machine Co., Chicago, to a Milwaukee convention of the Wisconsin Utilities Assn.

EDITORIAL + + +

Tit for Tat—II

THANKS to *Editor and Publisher* we are now able to return the compliment of the McClatchy and certain other newspapers whose zeal for smearing the utilities on any and every excuse leads them to give over almost half a page to itemized detail of every cent spent by Pacific Gas and Electric Co., Southern California Edison Co., and San Joaquin Light & Power Corp. in salaries, donations, and public spirited contributions to Boy Scouts, church socials, and community chest. Presumably it is wicked to spend money in such good citizenship activities, and a sinister motive must underlie it all. The public is led to believe that the utilities are subtly trying to buy these organizations and pervert them to the wickedness of private ownership.

Last year this magazine drew upon itself great protest from the newspaper publishers association for what it termed an "attack" upon newspapers when it asked some questions of newspaper owners. Rather generally, it is true, rather than specifically, it was asked whether newspapers ever paid any big salaries to their top men who had the biggest responsibility. It was also asked whether newspapers ever paid anything out for charity, for Boy Scouts, Community Chest, or church affairs, or whether they considered a little publicity to these affairs their full civic duty. It was likewise asked whether newspaper executives ever attended conventions, bought an advertiser's lunch, or did any lobbying at state capitals.

Unfortunately the means of prying into newspapers' private affairs and exposing them to the public is not as easily available as the same from the utilities. Forced to live in a gold fish bowl and reveal to the regulatory commissions every nickel spent, the utilities have no privacy. Only publicly owned utilities have privacy in such matters, the private utilities having to make public every expenditure. But the income tax publicity to rich men's salaries somehow did not exempt newspaper owners and executives, and so it is possible to look askance at a few of these wicked incomes.

Starting with that zealot for public ownership and decrier of big utility salaries, the late C. K. McClatchy received $60,083 last year. J. C. Hamilton, vice president of McClatchy Publishing Co., Sacramento received $30,000, and J. E. Langdon, managing editor, $30,000. By comparison George T. Cameron, president of *The Chronicle*, San Francisco, was a piker. He took only $18,000, as did Harlan G. Palmer, of *Hollywood News Citizen*. Even Harry Chandler, of the *Los Angeles Times* took but $24,100 and J. Baum, his business manager received more than he did, with $25,000.

The Scripps-Howard newspapers are notoriously poor pay, as most newspaper men know, and so but few of them are listed among the papers paying salaries over $15,000. Evidently those receiving less than $15,000 were not worth mentioning by *Editor and Publisher* in its survey. Yet columnist Heywood Broun bleeds his heart out for the poor working man at the tune of $31,366 per annum.

It would be interesting too, to know something of the size of the responsibilities of these men in terms of gross income of their properties, intricacy and importance of their organizations, territory and public services covered, and other factors by which could be measured the respective justification of earnings of them as against similar salaries in the utility business. But such facts are still private to a newspaper.

It is obvious, however, from just these few of many figures that the pot shows poor taste to call the kettle black.

Wiring, Like the Weather—

PARAPHRASING Mark Twain's famous comment on the weather, home wiring is one of those subjects about which there is plenty of talk, but not much action. Public recognition of the importance of this vital key to complete electrical usage lags far behind public acceptance of the services electricity and its manifold applainces will perform.

Search for the reasons for this lack of public appreciation leads one into an intricate web of alibis. A wiring system is not spectacular; it is hidden in the walls and is lacking in sales appeal. The contractor is not a salesmen; moreover, his margin of profit on the average job permits no sales effort or expense. The wiring supply business is split among many manufacturers; the individual volume of any single one precludes major expenditures for national sales promotion. No one branch of the industry is sufficiently affected to rally the other branches into a national promotional drive. There are countless others.

Fact of the matter is that every branch of the industry has a definite self-interest in wiring adequacy. It is the bottleneck that checks all sales, from simple lighting equipment even back to the apparatus that generates and transmits electric energy, as well as the energy itself. As such it merits immediate attention and action.

An adequate wiring program could be made an integral part of the several national promotional campaigns which the electrical industry is now fos-

tering. The Better Light Better Sight, electric kitchen and homewares campaigns might all incorporate sales arguments for more and better wiring. Unless some such action is taken, the electrical industry will continue to get but a spare 3 per cent of the building dollar while the plumber collects 15 per cent.

Superlatives and Progress

AMERICA thinks and acts in superlatives. Other nations deride this national philosophy, this pride in the biggest buildings, the fastest transportation, the largest power plants, this pride in ownership of the newest and best. Yet this national philosophy is a natural phenomenon—the result of rapidly disseminating knowledge from hundreds of sources. Out of schools, research foundations, industrial laboratories, field studies come continuous streams of new information, new ideas, sometimes even new elements. Individually they may mean little but collectively they fuse into an irresistible force for the advancement of science and engineering. The dream of yesterday is the marvel of today and the commonplace of tomorrow—overshadowed by newer and more spectacular achievements.

Consider the vast background of research, scientific achievement and engineering behind the construction of the country's newest and largest power project, Boulder Dam. A view of its Brobdingnagian proportions compels even the layman to marvel at the daring of modern engineering.

By virtue of sheer size alone, the project directs attention not only to the progress that has been made in the design of new equipment but also to the coordination in engineering activity made possible only by improved and more reliable means of transmitting intelligence. New construction equipment, improved explosives, better transportation facilities, refrigeration and air conditioning for the housing of labor, disease control and hundreds of other specialized items speeded construction activities. The 82,500-kva. generators, the new three-cycle circuit breakers, the hydraulic and electrical control systems, in themselves, all represent the spearhead of progress in new and more economical sizes of generating and transmission equipment. More wonderful still is the coordination of effort that permitted the project to be completed far ahead of schedule. Designs and specifications may have been written in Washington, Denver or Los Angeles. Interlocking pieces of apparatus, perhaps built on opposite sides of the country, dovetail together accurately. The knowledge of all fields in all sciences was mobilized to the end that all the problems of the project could be solved expeditiously and satisfactorily. And in the solution of these problems lies the embryo of still newer and greater achievement.

Nothing is impossible to a people who glorify the superlative—that people will demand a rising standard of living—that people is continually creating a greater civilization.

Please Define Your Terms!

AFTER listening to the radio during the past two months, during which every brand of political party, Republican, Democrat, Socialist, Communist, and clear through to the new Union party, spoke its piece, the faithful and the conscientious citizen who really wished to learn everybody's side of the argument in order to vote intelligently must have given up in hopeless confusion. What must have been most bewildering was that every party used the same words, the same ringing declarations, yet it just could not be that these phrases meant the same things to any of them. When Communist and Republican use the words "preserve our democracy," for instance, both could not have meant the same kind of democracy. In the same fashion every party spoke feelingly about preserving liberty and American freedom. All spoke about American traditions of one kind or another, and all claimed that Lincoln would have been on their side. It does not make sense that all were in such complete accord that there really are no issues at all.

In building bridges, or designing power plants, or any other works that are realistically and soundly constructed, engineers never use terms or quantities so wide in their meaning as to encompass anything and everything within the realm of possibility. If there is any doubt as to the meaning of their terms they define them. Perhaps this is why works that are built by engineers endure, and social and economic programs built by politicians break down.

From out of all this carbon copy eloquence we of the electrical industry, for example, should like some definitions as to what each camp proposes to do to or with the electrical industry. Or is that asking too much?

Our present New Deal is active in the promotion of strict legislation to force manufacturers to tell exactly what is contained in every can of vegetable soup or throat wash offered a long suffering public. This solicitude to protect the poor public from fraud in the shape of inferior, unnourishing fillers and inexpensive and useless prescriptions, is commendable enough, if it is practical. Might it not be well to ask the same solicitude for the public as to the actual content of political speeches and platform promises? As it is, the public after buying (and paying and paying into the third and fourth generation) may find that it has received only a little sugar and colored water, instead of the real medicine of recovery.

One thing is certain. In the words of that negro spiritual, "All those talkin' 'bout Heaven ain't goin' there."

Significant Trends + + +

[Signposts which point the road to improved business or method, brief, pertinent, useful hints as to HOW someone has blazed a new trail]

Drafting Room Production Improved With Light

When 430 men, nearly all draftsmen, are working together in a single room, air and lighting conditions must approach perfection. For small annoyances will then produce great reductions in the quality and volume of output. It was this consideration which led the Douglas Aircraft Co., at its Santa Monica factory, to select electric heating and combined Mazda and mercury vapor lighting for its new 300x125-ft. engineers loft.

The sensitivity of drafting paper to humidity and the necessity of providing 52- to 70-ft.-candles illumination on the exacting drafting work were major influences in design of the unique heating and lighting installations. Together these constitute a connected load of more than 360 kw.

To the shrinking and curling of tracing paper, which occurred when the room was heated with gas, was added a second difficulty. Warm air would collect at the top of the room where heat was quickly lost through the exposed, galvanized iron roof.

To overcome these difficulties, a floor-type electric heater utilizing standard G. E. industrial strip heating units and a small electric fan was designed by L. N. Davis, plant superintendent. Forty such units were installed in the room.

Each heater was built into a double-wall, galvanized-iron box, insulated between the walls both by air space and asbestos. The box was divided within by a vertical baffle. Floor grills were constructed with slots running in the direction of the topline of the baffle, and intake and outlet slots were set at opposite angles pointing upward and outward.

The fan sucks air through the intake and blows it under the baffle after which it passes the three, 2-kw. General Electric standard industrial strip heaters and leaves through the outlet grill with a motion component parallel to the floor.

Effect of these heaters is to maintain circulation of warm air along the floor.

...in Lighting

Fans may be operated separately for air circulation on warm days, and provision was made within each heater for addition of a fourth 2-kw. strip heating unit in case initial capacity is found inadequate.

Lighting was achieved with two rows of 300-watt Mazda lamps in 500-watt Benjamin glass-steel fixtures together with one row of 1,000-watt high intensity General Electric mercury vapor units for each of the four sawtooth bays running the length of the loft. Lamps are spaced 12½x8 ft., with a mounting height of 11 ft. for the Mazdas and 15 ft. for the mercury vapor units.

The installation totals 48,000 watts of mercury vapor units and 72,000 watts of Mazdas. This combination has been found to produce excellent color values, and draftsmen report that working conditions under the artificial illumination are more satisfactory than with daylight.

Service to the loft provides 440 volts to the heating elements and 115 volts to the fans. In addition to control by thermostats, off-peak control limits the maximum demand.

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• MODERN LIGHTING moved conspicuously into non-urban territory in California last month as a feature in the construction of an attractive residence at Lakeport, Lake County. E. McAlester, commercial lighting salesman for the Pacific Gas & Electric Co., cooperated with the owner in conforming modern lighting efficiency and comfort to the architectural demands of the Spanish house. Cove, inbuilt and semi-indirect installations were combined with liberal use of Lumaline lamps within, while flood lighting was laid out for the grounds.

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• SECOND ANNIVERSARY OF I.E.S. better-sight lamps will be celebrated with a nationwide promotion program in October, according to plans announced by the National Better Light Better Sight Bureau in New York.

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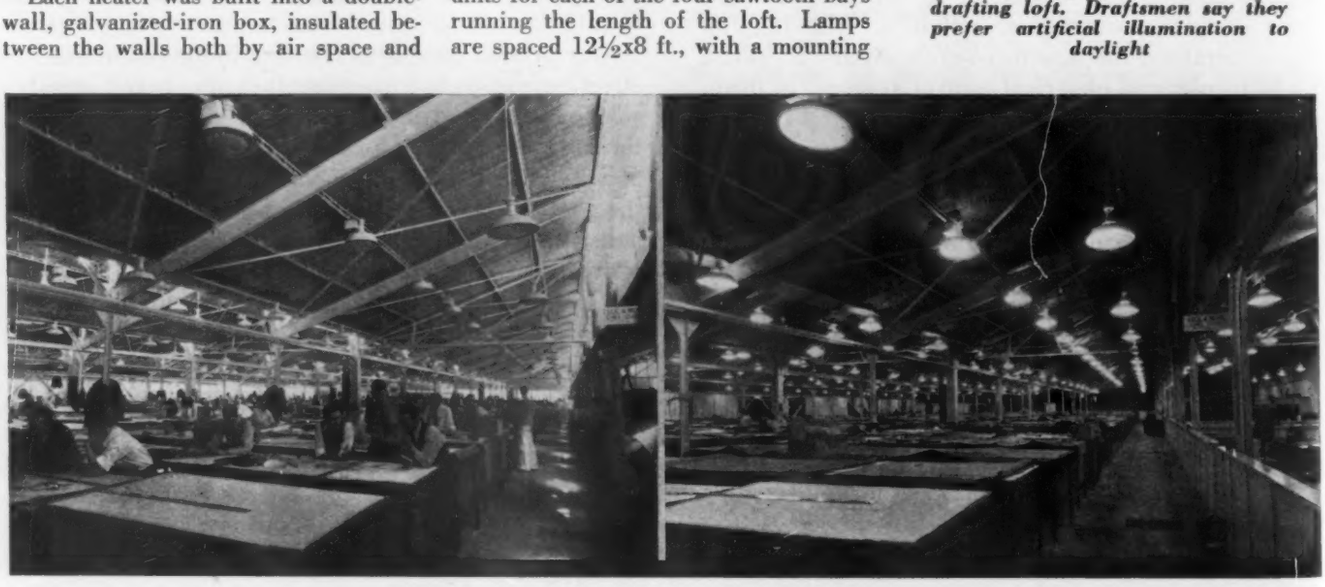
Day and night in the Douglas drafting loft. Draftsmen say they prefer artificial illumination to daylight



"I Couldn't See"

Written by Richard E. Smith, executive assistant of the Southern California Edison Co., Ltd., the play, "I Couldn't See" dramatized for electrical groups the dangers of poor lighting and the possibilities for good. It was presented first at the Fresno conclave of the Pacific Coast Electrical Assn. Above, Eugene Kruger administers first aid to a bad-light victim, Foster K. Sampson. Below, Kruger becomes the patient, while J. L. Fitch and Miss Barbara Smith are doctor and nurse. W. B. Cheney completed the cast

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New I.E.S. Lamps Specified

Specifications for the new I.E.S. reading lamp, which has been exhibited at summer showings are described by the Engineering Illuminating Society as aimed to give essentially diffused direct light with proper spread and brightness flux of acceptable limits.

In the new lamp the upward light component has been specified as 10 per cent. Total light output has been specified at 65 per cent minimum. Specifications for illumination on the working plain in comparison with those for the study lamp are:

Distance from Base	End Table Lamp	Study Lamp
18 in.	25 ft.-candles	20 ft.-candles
24 in.	20 "	10 "
30 in.	10 "	7 "

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• PENINSULA DAILY HERALD, newspaper of Monterey, has installed four high-intensity mercury vapor units in its composing room. This test installation is being made to find whether the new lighting will cause a complete relighting of the offices and plant of this paper.

Spot Drying by Flood Light

In even the largest automotive repair shops, equipped with the most modern paint spraying departments, there is a certain amount of spot work that can be cared for without moving the vehicle into the spray room under the exhaust hood.

First, the small spot on fender or body is cleaned with a portable grinder and buffer, and then sprayed with a small air brush. To hasten drying, an ordinary flood light adjustably mounted on a standard is moved up close and its rays directed upon the spot, drying it in short order.

The lamp illustrated here is at work in the shop of the Francis Motor Car Co., of Portland.

Flood-light used as dryer in automotive repair shop

• INTRODUCING A LOW-COST WINDOW LIGHTING control plan which can be used effectively by lighting salesmen in the commercial departments of utilities, as well as by wide-awake electrical contractors, to develop more window lighting business is announced by M. H. Rhodes, Inc., manufactures of the Mark-Time switch. The plan is complete with brochures, mailing pieces and an unique cutout which is slipped over the door knob of a prospect's store by the salesman or contractor. "Last evening the window shoppers could have seen your window display if you had a Mark-Time switch to turn your lights on and off," this cutout says, and makes a special offer of such a switch. The economy of being able to preset easily the timing for a window, based on the weather conditions, so as to save energy costs during stormy weather when window shoppers would not normally be out, is a special feature.

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• ILLUMINATION of Washington Park in Denver will reveal to night visitors this summer one of the largest flower gardens in the United States. Already installed is a preliminary battery of fourteen 1,500-watt units, located in trees. George A. Collins, deputy manager of parks, backed by his chief, George E. Cranmer, said he was led to make the installation by the enthusiasm over extensive night lighting of private gardens in Denver.

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• RAILROAD CROSSINGS are being illuminated nightly at Alhambra and Santa Monica, Calif., by General Electric sodium lamps. Two 1,000-candle-power lamps are employed in each installation. City Manager O. S. Roen of Alhambra states public response has been enthusiastic. "Records indicate that several night time accidents have already been avoided," Mr. Roen said.

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Sodium Lamps Light Railway Crossings

Santa Monica, Calif., has lighted these two railway grade crossings with four General Electric, 1000-candle-power sodium luminaires to warn motorists of the dangerous area. One unit is placed on each side of the interurban tracks

News of Note + + +

New Officers Chosen By Northwest Assn.

George M. Gadsby, president of the Utah Power & Light Co., Salt Lake City, was elected president of the Northwest Electric Light & Power Assn. for the year ending July 1, 1937. He succeeds K. M. Robinson, president of the Idaho Power Co. Election took place at the recent annual meeting of the Association in Boise, Idaho.

W. C. Mainwaring, commercial manager of the British Columbia Electric Railway Co., Vancouver, was elected vice-president. Other officers are R. B. King, Idaho Power Co., Boise, vice-president for Idaho; F. W. Bird, the Montana Power Co., Butte, vice-president for Montana; LeRoy A. Grettum, Eastern Oregon Light & Power Co., Baker, vice-president for Oregon; P. M. Parry, Utah Power & Light Co., Salt Lake City, vice-president for Utah; Frank Walsh, Puget Sound Power & Light Co., Bellingham, vice-president for Washington, and W. G. Murrin, B. C. Electric Railway Co., Vancouver, vice-president for British Columbia.

Elected as members at large of the executive committee were J. E. E. Royer, The Washington Water Power Co., representing utilities, and J. A. Kahn, General Electric Supply Corp., Salt Lake City, and W. D. McDonald, Westinghouse Electric & Manufacturing Co., Seattle, both representing non-utilities.

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Court Holds Edison Co. Valuation to Be Valid

Validity of the $288,700 valuation of the distribution facilities of the Southern California Edison Company in Tulare, Calif., found by the California Railroad Commission in 1933 has been upheld in a decision handed down by the California State Supreme Court. Suit testing the validity and fairness of the valuation had been brought by the company.

Testimony that the condemnation proceedings involved only property and not rights was upheld by the court. The decision declared:

"The petitioner is in no position to be compensated for this property at an exorbitant figure merely because in an independent proceeding and with other conditions in view it has been given the benefit of such a high return for the use of the property sought to be condemned.

"This is especially true in the present proceeding for the reason that the record is sufficient to support the contention of the commission that, with the Tulare unit removed from the operation of its established rates, the company still will receive a reasonable return upon the balance of its property."

The company contended in its suit that earnings should have controlling significance in the condemnation proceedings and that consequently it was entitled to receive more than $288,700 for its Tulare system, which being "cream" territory, has earned as high as 20 per cent on the investment. Such earnings were essential, according to the company's claims, if service was to be provided to the lean agricultural back country at rates the agriculturalists could afford to pay.

City officials state that the next step will be the calling of a bond election for the purpose of purchasing the Edison distribution facilities.

•

Utah City Studies Municipal Ownership

Agitation for the establishment of a municipal power system in Provo, Utah, has reached the stage where a preliminary cost estimate of $836,310 has been submitted to the City Commission by City Engineer Elmer A. Jacob. Estimated cost includes a power plant, $404,800; distribution system, $264,510; engineering and supervision, $67,000; and interest during construction and contingencies $100,000.

The proposed plan contemplates the purchase of the distribution system of the Utah Power and Light Company, if satisfactory terms can be arranged, the engineer's report states. If this is impossible, the report points out that the city can construct a parallel system. The plant would be financed with bonds sold to the John Nuveen Co. of Chicago.

•

Construction to Start on Boulder-Pioche Line

Actual construction of the 155-mile Boulder Dam-Pioche transmission line in Nevada, estimated to cost $900,000, will start shortly after Aug. 1. It is anticipated that by that time legal technicalities surrounding the sale of Lincoln County Power District Bonds will have been cleared away.

Nine contracts for material totaling $382,660 have been awarded and three contracts totaling $195,966 including that for general construction work have been tentatively awarded. Four contracts have not as yet been advertised. Bids have been called for transformers estimated to cost $239,873 for Aug. 14.

Los Angeles Plans for Electrical Age Exposition

Paving the way for the first Electrical Age Exposition, to be held in Los Angeles, Oct. 10 to 18, The Electrical Development League of Southern California reports that already more than 26,400 of the available 40,000 sq. ft. of floor space has been spoken for. The exposition will celebrate the coincidental arrival in Los Angeles of power from Boulder Dam.

First big gun for awakening Southern California electrical men to the sales possibilities offered by such an exposition was fired in the Edison Auditorium last month. Plans were laid for cooperative action to guarantee maximum effectiveness of power arrival in terms of sales.

Financial mainstay, aimed to cover operating costs, is $20,000 contributed by the Bureau of Power and Light and the Southern California Edison Co., Ltd. Exhibitors sign up for the number of square feet they desire, and post a 50c-per-foot guarantee, in the event of loss. The budget for publicity and entertainment has been set for $20,000. The plan is to raise this fund from paid admissions.

Aimed to promote general public enthusiasm over the possibilities of individual and community gain through increased electrical use, the exposition will be exclusively electrical, incorporating all types of electrical appliances used in the home, and will be managed entirely within the electrical industry.

It will be held in the Pan-Pacific Auditorium, Beverly Boulevard east of Fairfax. General manager is F. L. Hockensmith, while George Belsey is chairman of the exposition committee composed of H. H. Fogwell, Don Hill, R. G. Kenyon, Jack Morse, J. L. Nicolay, Otto K. Olesen and William L. Schlegel.

•

• EXPENDITURE of more than $100,000 for the construction of 135 miles of new rural service lines is a part of the 1936 rural electrification program of the Portland General Electric Co. This company already operates a rural system of 2,300 miles of lines. The 1936 program is approximately one-third greater than last year's construction when 100 miles were added.

•

• WINNEMUCCA, NEV., has been notified that a grant of $54,370 for construction work in connection with its electric light and power plant has been approved by the PWA and is awaiting presidential signature.

S. Cal. Edison Reports Big Quarterly Gain

Gross earnings of $10,097,887 for the second quarter of 1936, compared to $8,979,075 for the same quarter last year, were reported for the Southern California Edison Co., Ltd., by Harry J. Bauer, president. Net earnings, after deducting operating expenses, maintenance, and taxes, were $6,459,988 as against $5,722,706 last year, while the amount remaining for dividends after depreciation and fixed charges was $3,130,610 compared with $2,723,586 for the same quarter of 1935.

After payment of dividends on all classes of preferred stock, the balance remaining for common stock amounted to 59 cents per share on 3,182,805 shares outstanding June 30, 1936, as compared with 32 cents per share on the same number of shares outstanding at the end of the corresponding period of 1935.

Gross earnings for the six months ending June 30, 1936, were $19,533,605 as compared with $17,275,041 for 1935. Net earnings, after deducting operating expenses, maintenances, and taxes, were $12,215,587 as against $10,664,663, while the amount remaining for dividends after depreciation and fixed charges was $5,867,744 as compared with $4,774,562.

Following is income account for the first six months of 1936 as compared with the corresponding period of 1935:

	6 Months Ending June 30, 1936	June 30, 1935
Gross Earnings	$19,533,605	$17,275,041
Operating expenses and taxes	7,318,018	6,610,378
Net earnings	$12,215,587	$10,664,663
Interest and amrotization of bond discount	3,907,870	3,733,764
Balance	$ 8,307,717	$ 6,930,899
Set aside as reserve for depreciation	2,439,973	2,156,337
Remainder for dividends .....6.....	$ 5,867,744	$ 4,774,562
Dividends on preferred stock	2,512,622	3,414,501
Balance for common.	$ 3,355,122	$ 1,360,061
Number common shares outstanding June 30.	3,182,805	3,182,805
Earned per share of common	$1.05	$0.43

●

• ELECTRIFICATION of the San Carlos Irrigation and Drainage District around Florence, Coolidge and Casa Grande, Ariz., is contemplated in plans calling for a $300,000 bond election to be held within the next 90 days. The project includes the construction of 110 miles of transmission and distribution lines to serve more than 500 customers.

●

• SOIL HEATING CABLE has started to grow plants for the 1939 exposition in San Francisco. Fourteen sections of soil cable have been installed in buildings constructed by WPA for the exposition company at Balboa Park, San Francisco.

The Standard News

August 1936 — Electrical Edition

Published by THE STANDARD ELECTRIC STOVE CO., Toledo, Ohio

One Yardstick

There is only one measure used in the Standard plant. That is the uniform measure of quality of material and workmanship.

Standard has often been asked to produce a *cheap* range, one to meet the varied competition which springs up hydra-headed from time to time. Standard has always met this competiton with a range of low price but without sacrifice of quality.

It just cannot be done—we mean cut the quality to meet a price. All Standards are good. There is no difference in the materials or workmanship between the largest and the smallest Standard. Difference in price is determined by size and accessories only. Standard's family does not think in terms of cutting quality or workmanship.

You can, with fullest confidence, select a Standard to exactly fit your needs or means, with full assurance that you are buying the best the market affords. The Jewel Box or Valley Queen, though low in price, is "just as good" as the "Collingwood" or "Coronet." The quality is exactly the same.—CHARLES A. PIERSON.

Are You Overlooking Something?

If you are a Standard dealer, you are passing up a real opportunity if you are not using your advertising allowance. Standard shares with the dealer in localized newspaper advertising. It works this way. You advertise in your local newspaper. Standard pays half of the bill up to a certain percentage of the dealer's purchases.

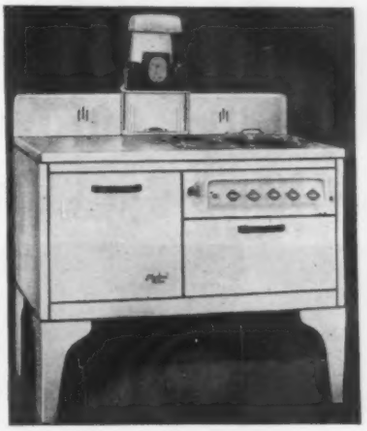
One dealer told us that he sold only a few ranges and that it would not pay to use the allowance. It is generally admitted that the business that does not advertise soon goes to seed. This dealer was shown that if he took advantage of his percentage, and placed ads in his local paper, the space would cost very little and give him regular coverage. In this way you can make one sale start another. It is in just such instances that advertising is most effective. Space used regularly soon identifies a dealer as alert and entitled to business. It turns a side street shop into headquarters.

Our service includes free cuts and mats and preparation of copy.

Models That Help You Sell

This is another of the beautiful Standard models that help you sell ranges. In the domestic assortment you will find every size from the smallest bungalow type to the largest range for the largest home. Standard has designed its assortment to give you complete coverage of the entire market. The range shown is "Collingwood" No. 1465, with leg base.

Each is equipped with the wonderfully efficient even heat oven. Each may have choice of open SPEED-HEET or enclosed KALMAX burners at no extra charge. If your customer wants a simmer burner in the six-inch size it is easily put in at



any time; or you may order the range that way. Each range has one Standard Lo-LOW burner, the new economical burner with the lower low heat for slow cookery. Standard accomplishes low low heat without external resistance coils. All the heat is right in the cooking surface. An exclusive Standard feature.

Get Into the Range Business

If you are not already selling electric ranges, now is the time to get started. The sale of electric ranges now equals the volume of the first boom years of refrigeration. The range is the next big household appliance to "go over."

In deciding on your line, of course we want you to consider Standard. There are various reasons for this suggestion. Some are reasons beneficial to us. But if there were not good reasons from your standpoint we would not have a leg to stand on.

Standard offers you a line backed by an organization which has never been out of contact with the electric range industry since the very first days of electric cookery. Over a quarter of a century of continuous operation as specialists in just one field of endeavor.

Standard is large enough to fill any orders in any quantity, and small enough to give attention to the smallest order. Standard is interested enough to give any dealer or user in any part of the world its careful attention.

Well over 165,000 Standards have been built and put into service, more than ten per cent of all electric ranges built to date.

Your inquiry will be promptly answered.

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THE STANDARD ELECTRIC STOVE COMPANY

Dept. C, Toledo, Ohio, U. S. A.

Inter-Connection Challenged By Cal. Project Authority

Seeking to protect future power markets for the Central Valleys Project, the California Water Project Authority has filed a brief with the State Railroad Commission asking for the establishment of a definite policy regarding the granting of future power permits in the territory to be served by the project. The brief bears upon the application of the Southern California Edison Company and the San Joaquin Light & Power Corporation for ratification of a power sales contract involving transfer of Edison surplus power occasioned by the introduction of Boulder Dam power into the southern California market.

Three points are proposed by the authority: (1) that no future permits be granted to private companies which will interfere with the marketing of power developed by the CVP; (2) that inasmuch as CVP is a going public project, it be granted priority to new markets; and (3) that nothing be done now which will prove of future injury to CVP.

The brief asks that the commission specifically give consideration to three conditions in its final decision. These are that the permit granted San Joaquin and Edison "shall not be construed to permit, allow, or authorize any act or thing thereunder which shall hinder, delay or obstruct the construction of the Central Valleys Project, or the sale, use or disposal of electric energy made available thereby;" that the permit shall not embrace the purchase or sale of an assured capacity in excess of 40,000 kw., the amount applied for, beyond the date when CVP power shall become available; and that the permit shall not operate or be urged in any way to constitute a basis for determining the value of or the price to be paid for CVP power.

The initial interconnection between the two companies will have a capacity of 60,000 kw. although the contract covers only 40,000 kw. The Edison Big Creek plants, which will furnish the energy, have an installed capacity of approximately 400,000 kva.

In a reply brief the San Joaquin Co. denied the contenton that the proposed agreement would in any way interfere with CVP. It was pointed out that if surplus power is not obtained from the Edison Company, expenditure of $4,000,000 for construction of a steam generating plant would be essential by 1938. Such a plant would later be superfluous upon development of CVP power. The brief further said:

"The fears of the water authority that Edison power might, by means of the proposed inter-connection, be used to flood northern California to the detriment of the CVP are wholly groundless . . . its having been shown that Edison . . . could not possibly afford to utilize anything but its surplus capacity to supply San Joaquin."

•

Transformers for Boulder Aqueduct to Be Ordered

Bids for what will be one of the largest transformer orders on record have been received by the Metropolitan Water District of Southern California. Fifteen transformers, to step down Boulder Dam power from 230,000 to 6,900 volts, will be installed in pumping plants along the water district's aqueduct from the Colorado River.

Aqueduct pumping ultimately will require 36 per cent of the electrical energy generated at the dam, making the Metropolitan Water District the largest single consumer of dam power. It will reach aqueduct pumping stations over a 237-mile transmission line, now under construction.

•

• NEGOTIATIONS between the municipal power departments of the cities of Glendale and Burbank and the Los Angeles Bureau of Power and Light over transmission of their share of Boulder Dam power have struck a snag. A contract submitted by the power bureau has been turned down by the municipalities.

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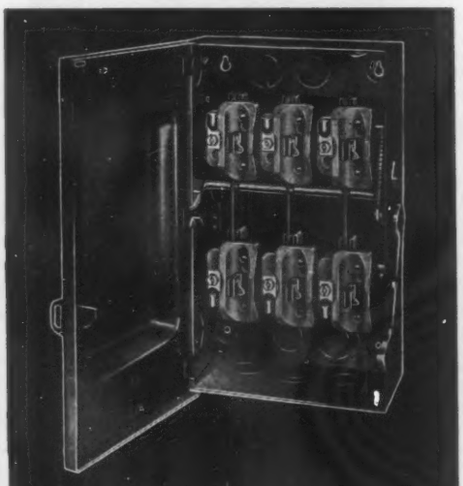

When you install a Heavy Duty Safety Switch, you expect it to take every type of punishment without a whimper—stand the gaff day in and day out. That's why Colt-Noark Type A Switches are built with extra ruggedness—extra strength—and with strong, efficient Quadbreak and Dualbreak mechanisms. When you specify Quadbreak or Dualbreak—you're getting a lot for your money!

Quadbreak and Dualbreak Mechanism

. . . for Strength, Efficiency, Long Life!

Colt-Noark Type A Switches in 250 Volt are Dualbreak as shown at left. In 575 Volt they are Quadbreak. Unit block construction—self wiping blades—roomy cabinets—plenty of knockouts—quick make and quick break—interlocking covers.

Colt-Noark Type A Weatherproof and Dust Tight Switches are Dualbreak. Rugged Cast Iron cabinets — interlocking covers securely fastened to cabinets by wing nuts—with rubber sealing gasket. 250 and 575 volts—fusible and non-fusible.

A new, complete Colt-Noark Catalog is now on our printer's presses. Full details on Safety Switches—Meter and Entrance Switches—Motor Starting Equipment—Fuses—Cast Iron Boxes.

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Colt's Patent Fire Arms Mfg. Co., ELECTRICAL DIVISION, Hartford, Conn.
H. B. SQUIRES CO., Pacific Coast Representative

COLT-NOARK
SWITCHES - MOTOR STARTERS - FUSES

Boulder Line Crosses Cities Despite Protests

Over protests of the cities of South Gate and Huntington Park, construction of the last few miles of Boulder Dam transmission line is being completed through right of way of the Los Angeles city Power Bureau. Construction follows refusal of the State Supreme Court to grant an injunction to halt the work.

Despite the fact Los Angeles held right of way, the thought of 287-kv. lines passing through their residential districts led the two small cities to attempt to stop the work by recourse to courts. Losing their case in the Los Angeles Superior Court, they appealed in the District Appellate Court, where hearing is pending.

Meanwhile attorneys for South Gate and Huntington Park gained a temporary restraining order against line construction from the State Supreme Court. But upon hearing, the Supreme Court ruled that it could "not entertain applications in original proceedings in case on appeal in the District Court of Appeal."

At this word, construction crews returned to the right of way. Los Angeles attorneys state that the city would be heavily penalized if the work, partially financed by Federal funds, were not completed on schedule.

●

Temporary Setup Proposed For Bonneville Power

Creation of a temporary commission for handling the Bonneville power situation pending passage of congressional legislation will be effected immediately, according to word sent to the Pacific Northwest by Senator McNary of Oregon. The commission will consist of Army Engineers and the Federal Power Commission.

Such a temporary arrangement will permit tentative agreement on the write-off as a basis for power rate making, determine power rates and negotiate with prospective consumers. All decisions will be tentative and the preliminary survey and negotiations will enable the determination of requirements for the necessary final legislation.

●

• PLANS FOR THE REPLACING of 16 miles of open flume with 11 miles of tunnel between the Spring Gap and Stanislaus power houses on the Stanislaus River have been announced by the Pacific Gas and Electric Company. Costing in excess of $1,000,000 the project will require three years to complete. Initial work will be started on a 17,000-ft. section of tunnel. Elimination of excessive maintenance costs on the open flume is the reason for the tunnel project.

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We invite you to make use of our facilities for delivering out of stock standard insulated wires and cables from our Trenton Factory, or from warehouse stocks carried in principal cities, and for manufacturing to your order almost any type of insulated wire, cable or cord that you may require. The completeness of the Crescent line assures you of one reliable source of supply for practically all your wire and cable needs. The cooperation of our Engineering Staff is freely offered on all special wiring problems.

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Power Commission Reports On Rural Service Policies

Rate schedules and monthly bills for rural service, rural line extension policies, construction practices and estimated costs, actual mileage and investments in rural lines and farm service are discussed in the Federal Power Commission's report "Rural Electric Service" designated as Rate Series No. 8. Based upon data submitted by 327 utilities, each of which served over 250 rural customers in 1933, the report shows a total of 181,013 miles of rural extensions having a construction cost of $314,888,237, including a direct investment by customers of $13,770,012. Based upon these figures the average cost of construction was $1,740 per mile inclusive of transformers, secondaries, house services and meters. Customer density ranged from 3.70 to 6.52 customers per mile of line.

Six different classifications of line extension policies are cited. Examples of varied plans and policies are given in the report. Over 300 of the larger utilities were requested to submit data as to the present day costs for constructing a mile of line to serve 4 and 8 customers. For 3-phase construction to serve 4 customers per mile the cost ranged from $1,174 in Colorado to $2,732 reported by a California utility.

Impressed!

When "Les" Morrow, editor of "Electrical World", attended the A.I.E.E. convention at Pasadena, he expressed skepticism about California's fishing. H. W. Bertholas, superintendent of P.G. & E.'s Pit River plants, showed him proof and even let him hold the evidence when he visited the Pit plants

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- Concentrically wound bare neutral conductor, galvanized oval armor, weatherproof and flameproof finish.
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Lapp Line Post Insulators eliminate radio interference due to both dirt and electro-static conditions.

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Write for Bulletin No. 123 describing and cataloguing these insulators.

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F.P.C. Denies Application for Kettle Falls Project

Application of the Washington Water Power Co. for a license to construct a dam on the Columbia River, 110 miles upstream from the Grand Coulee project, has been denied by the Federal Power Commission. The Commission held the project would interfere with the development at Grand Coulee.

Not mentioned by the Commission were two sections of W.W.P.'s application: one claiming reimbursement of funds spent to date in determining the engineering feasibility of the Kettle Falls project, the other asking that action be held in abeyance until congress decides whether or not a high dam is to be constructed at Grand Coulee.

Company officials testified at the hearing that congress had never authorized a high dam at Grand Coulee, although it had appropriated funds for a high dam foundation. A high dam would inundate the Kettle Falls site.

License for construction at Kettle Falls was first applied for by the company in 1922. Dismissal was later recommended by the bureau of reclamation and the chief of army engineers, pending decisions on the Grand Coulee development.

•

Rocky Mountain Co. Resumes Flathead Project

Construction on the hydro-electric power project of the Rocky Mountain Power Co. on the Flathead River below Flathead Lake, in western Montana, has been resumed. Resumption was made possible when the Confederated Salish Tribes of Indians, and officials of the company, signed a new agreement providing amendments to the company's license. Under the new agreement the power company is to resume work within 30 days after approval of the agreement by the secretary of the interior and must complete at least one 77,000 horsepower unit by May, 1939.

Original license for the project was issued May 23, 1930, but operations were suspended in 1931. The first step in resumption is the conditioning of 9 miles of railroad to the dam site. It is expected that 500 men will be employed. The company will furnish the Flathead irrigation project with 5,000 horsepower of electric energy to pump water from the Flathead River into reservoirs, augmenting the present supply.

•

• RATE REDUCTIONS of the West Coast Power Co., serving South Bend, Raymond and rural areas, totaling $2,000 a year were announced by Director Ferd J. Schaaf of the public service department. Reductions became effective on billings of July 1, on both residential and commercial rates.

Federal Commission Requires New Accountings

Superseding present accounting practice for public utilities and licensees under jurisdiction of the Federal Power Commission, the Commission has announced a new and uniform system, effective Jan. 1, 1937. The new system, the Commission hopes, will be adopted by many of the State regulatory bodies. It was developed in cooperation with the National Association of Railroad and Utility Commissioners and will replace the present system which has been in effect since 1922.

As compared with present accounting forms, the new system is said by the Commission to be more definite and positive in its provisions, leaving less opportunity for the exercise of judgment and discretion. It requires complete accounting for all transactions between associated companies and lays the groundwork for uniform practice in accounting for replacements and maintenance charges.

In regard to utility property constructed or acquired in the future, the new system requires that actual costs be stated and classified. Property now held must, in transferring to the new system, be reclassified to show original cost (actual or estimated) to the person first dedicating it to public service. Differences between original cost and book cost must be carried in an adjustment account.

Depreciation, operating expenses, rents and other charges against operating revenues must be broken down into functional classifications so far as practicable, with a view to minimizing arbitrary charges in determining the costs of generation, transmission and distribution of power. Depreciation charges shall be made monthly.

A complete explanation of the new system has been sent to all companies affected by the order.

•

• PORTLAND CROSSARM CO. is a new industry in that city, with a capacity of 1,500 crossarms per 8-hour shift. Plant equipment is designed to make arms from 3x4 in. up to 6x8 in. in any desired length. Dipped and pressure treated arms as well as untreated arms are a part of the regular production schedule. R. F. Hubbard is general manager.

•

• PERMISSION TO CONSTRUCT a $500,000 substation in Vancouver has been granted the British Columbia Electric Railway Co. The city's zoning appeal board allowed construction on the north side of First Ave., between Nanaimo and Windsor Sts. The program is designed to improve power distribution in the eastern part of the city.

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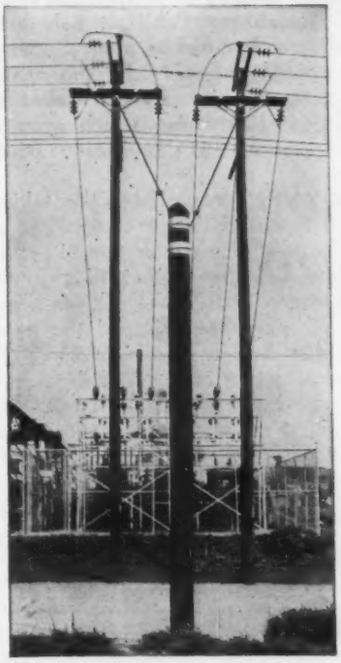
INDIANA STEEL & WIRE CO. Crapo Galvanizing MUNCIE, IND.



Specified for Most Important Jobs

Crapo Galvanized Steel Strand has earned its reputation for longer life and lower maintenance cost by outstanding performances in actual service over a period of years.

It constantly is being specified for the most important construction jobs because of its ability to more than meet every requirement for strength, ductility and resistance to corrosion.

Crapo Galvanized Steel Strand and Wire is available in all standard grades and sizes.

Indiana Steel & Wire Company
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(Left) New lines erected by Department of Water and Power, City of Los Angeles, and guyed with *Crapo* Galvanized Steel Strand.

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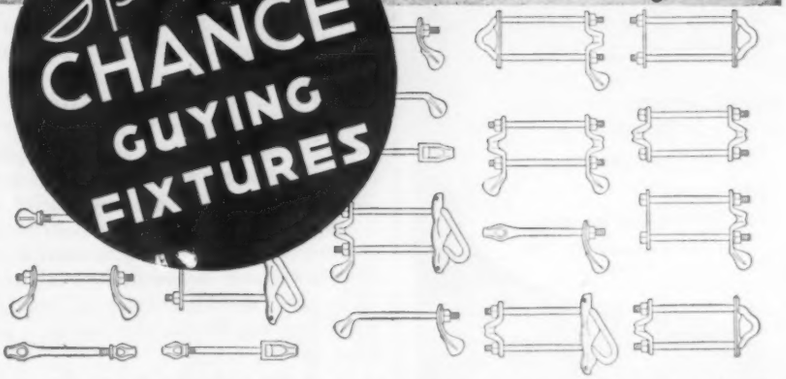

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Chance Guying Fixtures give Economy, Strength, Simplicity, and Efficiency to all dead-ending work. They do the work better and neater than the old method of wrapping the pole with the guy, as well as saving the length of the strand necessary to circle the pole. They may be used individually or in combinations of several.

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NO BAD EFFECTS!

When a forging is galvanized.

The temperature of the molten zinc bath causes no bad effects on the physical characteristics of steel forgings.

Engineers—make a mental note of this. BTC Forged Copper-Steel Hi-Line Hardware is meeting the most severe specifications.

After careful preparation, the parts are hand-dipped and hand-drawn, insuring a smooth, uniform, continuous coating of pure zinc as heavy as is consistent with permanent adherence. They come to you as one of the finest hot-galvanizing jobs obtainable.

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San Francisco Considers New Hetch Hetchy Plans

Three new plans for the municipal distribution of Hetchy Hetchy power necessitated by the refusal of the Interior Department to accept prior proposals have been submitted to the San Francisco Board of Supervisors by Utilities Manager Cahill. All three schemes are designed as alternate ways for the city to comply with the ruling of Secretary of the Interior Ickes as regards the Raker Act which granted the city rights to Tuolumne River waters.

Plan seven contemplates the taking over of the entire Pacific Gas and Electric Co. distribution system in San Francisco and distributing to all consumers except the Market St. Railway. Estimated purchase price of the company's distribution system is $39,700,000; construction of the Red Mountain Bar power house is set at $1,125,000; construction of office, shop, warehouse and the purchase of equipment is estimated at $2,000,000 and $875,000 is set up for materials, supplies and working capital.

Under this plan power from the Moccasin Creek and the proposed Red Mountain Bar plants would furnish base load and the necessary additional energy would be purchased from the Pacific Gas and Electric Co. at published wholesale rates.

Plan five would call for an investment of $27,015,000. It proposes construction of a transmission line from the Newark substation, erection of a steam standby plant and purchase of a portion of the P.G.&E. distribution system to serve 125,000 consumers in the Mission district and western sections of the city.

Plan six, involving $46,286,000, includes expenditures for increasing the capacity of the Moccasin Creek power house to provide peak capacity for distributing power to all residential sections of the city and to industrial and commercial consumers outside the downtown and heavy industrial areas. This plan would utilize all available water but would give the station a poor load factor.

As in the case of the first four plans submitted last fall, rate reductions are promised to bring proposed schedules below those now in force in the city.

As possible means of financing any power venture the board of supervisors has passed an ordinance to authorize the issuance of revenue bonds by the Public Utilities Commission without a vote of the people. This ordinance was passed for the purpose of providing for a court test to determine the legality of such action. In prior elections the people of San Francisco have voted against revenue bonds being authorized by less than a two-thirds vote and also have defeated proposals for smaller expenditures to put the city into the power distribution business.

In the meantime hearings will be held with the idea of selecting one of the three new plans to be submitted to the voters, possibly in November, in the form of a revenue bond proposal.

•

• BREUNERS IN SACRAMENTO now claim the largest appliance department west of the Mississippi. Their appliance department has been established in new quarters, where 10,000 sq.-ft. are devoted exclusively to the display of this equipment.

•

• LINE AND SUBSTATION improvements to increase capacities in the Palouse region south of Spokane are being speeded by the Washington Water Power Co. During the past month 62 miles of transmission line between Lind and Pullman, which has been operating at 60 kv., were reinsulated for 110 kv. operation by a live line crew under Chester Coons. The hot-line work was performed without a single accident.

Approximately 25 miles of new 110 kv. line has been installed between Palouse, Moscow and Pullman. A new 110-kv. substation is being erected at Davenport, Washington.

CHROMALOX

Super-Speed

RANGE UNITS

That's why power companies and dealers servicing ranges are saving big money in inventories by standardizing on these units for replacement in all ranges. For details, write us or our nearest representative.

EDWIN L. WIEGAND CO.

PITTSBURGH, PA.

Represented by

MONTGOMERY BROTHERS

911 Western Ave., Seattle, Wash.
1501 N. W. Kearny St., Portland, Ore.
61 Fremont St., San Francisco, Calif.
912 E. 3rd St., Los Angeles, Calif.

THE PETERSON COMPANY

1921 Blake St., Denver, Colo.

...about People

Puget Sound P. & L. Makes Promotions

Promotion of A. L. Pollard to general superintendent of light and power for the Puget Sound Power & Light Co., in Seattle, headed a series of promotions which became effective last month. In his new post, Mr. Pollard will supervise the work of division superintendents and will coordinate all construction and operating practice.

Mr. Pollard was employed by Stone & Webster as a student engineer for the Houghton County Electric Co., in Michigan, in 1912. After artillery and air corps service in the World War, he accumulated electrical experience almost everywhere in North America. He is past president of the Electric Club of Washington.

Succeeding Mr. Pollard in his former position, is E. R. Nigh, for the past 7 years superintendent of light and power in the Everett district. He has been promoted to superintendent of light and power and steam heat, central division. Mr. Nigh is also a war veteran, corps of engineers. He is a graduate of Purdue University and first joined the company in 1908.

J. Harvey Leach was named advertising director. He succeeds L. A. Williams, who recently became district manager. He has been editor of the company's publication Puget Power News.

A. L. POLLARD

E. R. NIGH

J. HARVEY LEACH

•

• Robert R. Robinson, consulting electrical and mechanical engineer, has become a business partner in the W. D. Howze Sales Co., 422 Alpine St., Los Angeles, manufacturers and distributors. Mr. Robinson's new association followed his return to Los Angeles after a European business trip.

•

• Franklin D. Howell, Los Angeles, Calif., civil engineer, has been appointed to the Los Angeles Board of Water and Power Commissioners to succeed A. F. Southwick, subject to the approval of the city council. Mr. Howell, a resident of Los Angeles for 34 years, is a past president of the Los Angeles chapter of the American Society of Civil Engineers. He was chief engineer of the city's Board of Public Utilities from 1915 to 1918. Mayor Shaw also announced the appointment of James Bolger as a member of the Board of Public Works. Mr. Bolger is secretary to the chief of police. He will succeed Rex W. Laws who is resigning.

PROFESSIONAL SERVICES

ELECTRICAL TESTING LABORATORIES

Electrical Photometrical, Chemical and Mechanical Tests. Inspection of Materials and Apparatus at Manufactory.

80th St. and East End Ave., New York

ARTHUR R. KELLEY
CONSULTING ENGINEER

Reports and Valuations, Public Utility Industrial Properties

Edison Bldg. Los Angeles

MAKE THIS PULL TEST

S&C FUSE LINKS are STRONGER

•

No Need For Over-Size Links

You can apply fuse links as low as 1 ampere — get better protection for your small transformers — if you use S & C Universal Links.

Actual records show that these small (1 to 10) amperage S & C spring-type Links have effected amazing savings in time, money and annoyance . . . The metal sleeve around the fuse wire acts as a surge-gap and the links do not blow on surges.

also—Use in your present Cutouts

If your cutouts are not S & C make—you can still take advantage of the greater strength, accuracy and protective dependability of S & C Links because they are UNIVERSAL — they fit ANY cutout . . . Made in capacities 1 to 100 amperes.

Make comparisons yourself — let us send a sample order. New Pamphlet AD-1305 mailed on request.

SCHWEITZER & CONRAD, Inc.

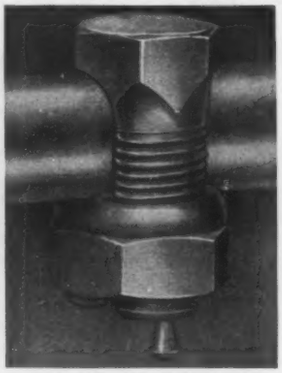
4435 Ravenswood Ave., Chicago, Ill.

WESTERN REPRESENTATIVES

San Francisco: Geo. E. Henn, 420 Market St.; Los Angeles: Farnham & Cunningham, Edison Bldg.; Seattle: T. S. Weed, 220 Ninth Street, N.; Salt Lake City: Ambler & Riter, Kearns Bldg.

Mfg. in Canada by Powerlite Devices, Limited, Toronto, Canada.

KEARNEY



CON-NEC-TITES

GIVE MAXIMUM CONDUCTIVITY

Smooth, rounded corners—no sharp edges—full round washer—nut retainer—made of brass, bronze or copper—full range of sizes—all types.

MAYDWELL & HARTZELL
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Los Angeles ★ San Francisco

MAYDWELL

Glass Insulators

All Standard Numbers For All Purposes

Made of high quality materials in a modern Pacific Coast plant producing an unusually tough glass to withstand all severe service conditions.

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Los Angeles ★ San Francisco

Fred Hodge Sales Manager Of Nevada Utility

Fred Hodge has been made sales manager of the Sierra Pacific Power Co., Reno, effective July 30, according to an announcement by George A. Campbell, president. For the past four years he has been a member of the company's sales department specializing on dealer contact work in connection with the cooperative merchandising program of that utility.

Mr. Hodge is a graduate in electrical engineering from the University of California. He completed the student's course at eastern plants of the Westinghouse Electric & Manufacturing Co. and returned to California to take a position as salesman in the East Bay Division of the Pacific Gas and Electric Co. Following this he became sales engineer specializing in water and house heating for Wesix, Inc., which position he held for four years prior to going to Reno on Dec. 1, 1932.

●

• COMMANDER RICHARD R. LUKENS, U.S.N., has been appointed head of the U. S. Coast and Geodetic Survey's San Francisco office. He succeeds Capt. Thomas J. Maher, who has been transferred to Manila, P. I., after eight years at the San Francisco office, where he figured prominently in the organization of seismic investigations in California.

●

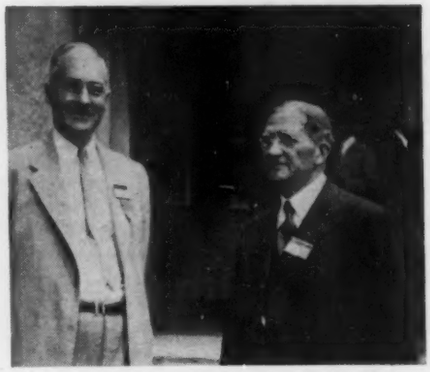
• JAMES A. SMITH, well known to electrical inspectors on the Pacific Coast for his activities as representative of the Electrical Cord Manufacturers at the last few conventions of electrical inspectors, has become associated with the Anaconda Wire & Cable Co., New York City. He is succeeded as director of the Electrical Cord Manufacturers by J. W. Whittington. Mr. Smith has been active particularly in giving publicity to the efforts of inspectors on behalf of public safety.

●

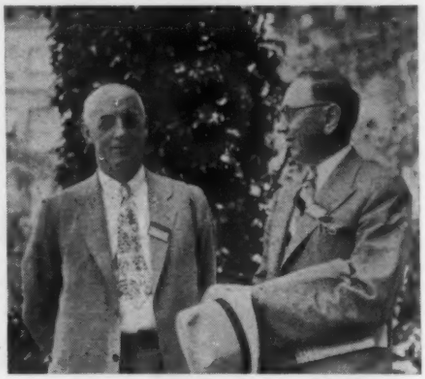
• JACK DOUGLAS, well known to Pacific Coast dealers from his activities with General Electric Co. on the Pacific Coast several years ago was a recent visitor to San Francisco en route to Java by way of the Philippines, Japan and China. During the past year or more Mr. Douglas has been in Mexico and before that in South America in sales activities for International General Electric Co. His work in the orient will be for the same company.

●

• BERT Y. GIBSON, well known on the Pacific Coast for range sales work recently left Howell Electric Co., Reno, where he was sales manager of the appliance department, and is now with Stevenson Drug Co., Winnemucca, Nev.

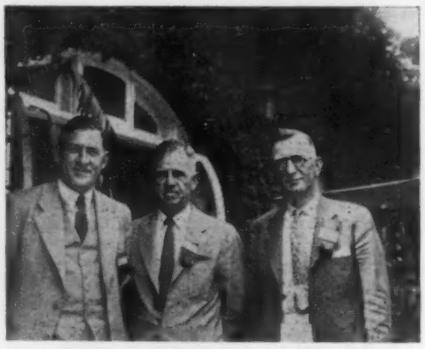


C. P. Garman and E. F. Scattergood of the L. A. Bureau of Power & Light



Institute President, A. M. McCutcheon talks to Sam Russell, S. F. manufacturers' representative

Okonite's W. K. Vanderpoel discusses a certain N. Y. snake story with San Diego's L. M. Klauber



Committeemen H. C. Tice, Southern Cal. Edison Co., J. C. Jones, and David Hall, Westinghouse El. & Mfg. Co.

Engineers Enjoy Fellowship of Annual Convention

These two groups of A.I.E.E. Conventioners typified the informal sessions of the convention. At the left, the photographer interrupted a chat between R. W. Sorensen, Convention Chairman (center) and two Portlanders: "Ed" Pearson, Northwestern Electric Co. and "Bill" Hynes, G. E. Company. At the right and reading from left to right are L. J. Moore, San Joaquin Light & Power Corp., "Joe" Henkel, R. R. Robley and O. B. Coldwell, all of the Portland Electric Power Co., Hugh Laidlaw of Pacific Gas and Electric Co. and Lorin Nott, Sangamo Meter Co. of San Francisco

•

Carmody Appointed As REA Administrator

John N. Carmody, now one of the three members of the National Labor Relations Board, has been appointed assistant administrator of the Rural Electrification Administration. He will assume his new duties August 17.

Mr. Carmody was formerly editor of *Coal Age* and *Factory and Industrial Management*. Subsequently he served as mediator for the first National Labor Board, as chairman of the National Bituminous Coal Labor Board under NRA, as member of the National Mediation Board, and as chief engineer of the Civil Works Administration. He was appointed to the NLRB last September.

•

• JAMES R. KEARNEY, together with F. W. Kearney and T. C. Clark, all of the James R. Kearney Corp., and H. F. Hartzell of Maydwell & Hartzell, recently congregated in Los Angeles. Various members of this group were in attendance at displays of Kearney equipment held successively in Los Angeles, San Francisco and Seattle.

•

• SAM E. GATES, Los Angeles, district manager of the General Electric Co., has been appointed general chairman of the thirteenth annual funds appeal of the Los Angeles Community Chest. Mr. Gates has been identified prominently with the Community Chest for ten years.

A Thirty-Year-Old Plant is Restored to Modern Efficiency

Rehabilitation Costs Yield Large Return

This modern, high efficiency straight-flow nozzle, together with a runner of latest design, was practically all the hydraulic equipment needed for modernizing a thirty-year-old plant in California. From the standpoint of power output, operating cost, efficiency and safety, the modernized unit is far superior to the original installation, reconstruction costs having been comparatively insignificant.

Further details on this and other rehabilitated plants may be readily secured from Pelton engineers.

The Pelton Water Wheel Company

HYDRAULIC ENGINEERS

120 Broadway NEW YORK | 2919 Nineteenth St. SAN FRANCISCO | Paschall Station PHILADELPHIA

PELTON

For Western
INDUSTRY

CROCKER
FIRST NATIONAL
BANK
OF SAN FRANCISCO

Member Federal Deposit Insurance Corporation

***YOU CAN MAKE QUICK PROFITS WITH FAST Selling* CLIFTON**

FRICTION TAPE
FRICTION CLOTH
AND SPLICING
COMPOUNDS

Represented by

GEO. E. HONN CO.
420 MARKET ST., SAN FRANCISCO

ASSOCIATED SALES ENGINEERS
912 EAST THIRD ST., LOS ANGELES

ALBERT S. KNIGHT CO.
3006 WESTERN AVE., SEATTLE

COMPLETE STOCKS CARRIED AT
ALL 3 PACIFIC COAST POINTS

CLIFTON MFG. CO.
65 BROOKSIDE AVE., BOSTON, MASS.

W. A. Hillebrand Dies Suddenly in Akron

W. A. Hillebrand, professor of electrical engineering, University of California, passed away July 24 in Akron, Ohio, after a six-day illness. He had been employed for the summer in a consulting capacity by the Ohio Brass Co., Barberton, Ohio, and was working at the factory when stricken by the fatal attack.

Professor Hillebrand was well known in educational fields having taught at Oregon State College, Stanford University and the University of California. From 1914 to 1932, when he joined the faculty of University of California, he

W. A. HILLEBRAND

was employed by a number of companies in the electrical industry, leaving the Ohio Brass Co. to again enter the educational field. He was considered a national authority on insulation and power transmission as well as one of the most successful and popular educators in the engineering profession on the Pacific Coast.

He was prominent in industry activities, being a member of the P. C. E. A., the Institute of Radio Engineers, the American Institute of Electrical Engineers, having assumed chairmanship of the San Francisco Section of the A. I. E. E. a few days before leaving for the East.

•

• J. A. ROCKWOOD, valuation engineer of the Portland General Electric Co., Portland, died July 4, of heart disease. In 1908 Mr. Rockwood went to Portland with W. S. Barstow & Co. to install the first underground system of the G.E. Co.'s predecessor. On completion of this job he joined the engineering staff of the Portland company, where he became estimator, statistician, and lastly engineer in charge of the valuation department.

•

• BENJAMIN F. DELANTY, general manager of the Pasadena light and power department, on a trip to the East will inspect transformers being built for his department by the Allis-Chalmers Co. at Milwaukee, Wis. The transformers, for the reception of Boulder Dam power, will be installed on East Glenarm St., adjacent to the department's steam station. Mr. DeLanty will represent the Pasadena Lions Club at the annual convention of the service organization at Providence, R. I., and will also visit Detroit in connection with city business.

•

Utah Contractor Chosen For Townsend Committee

Townsend clubs of Utah recently elected as their representative on the advisory board of Dr. Francis E. Townsend, E. H. Eardley, Salt Lake City electrical contractor. Each state is entitled to one representative on the board.

Mr. Eardley has been engaged in electrical contracting in Salt Lake City for 40 years, having first worked on the construction of the Salt Lake temple. He was a member of the State board of education from 1918 to 1920.

•

• NORMAN B. HICKOX, vice-president, Curtis Lighting, Inc., of Chicago, addressed the San Francisco Bay Cities Chapter, Illuminating Engineering Society, at a meeting June 30. The occasion for his talking provided his listeners with an opportunity to ask a number of questions regarding the operation of the I.E.S., of which he is a member of the national council. He told of the development of standards for I.E.S. lamps and of future possibilities in the establishment of standards for other types of illumination as well.

•

• HARRY TECKLENBURG, since 1912 an employee of the Puget Sound Power & Light Co., has been promoted to superintendent of light and power in the Everett district, succeeding E. R. Nigh. He was born in Everett, but has recently been employed in the Seattle offices as service superintendent. Roger A. Walker succeeds Harry Tecklenburg as service superintendent in the Central Division. Ewing S. Crawford becomes suburban service supervisor and Arthur Church becomes inside service supervisor in Seattle.

•

• L. W. GROTHAUS has been elected vice-president of Allis-Chalmers Manufacturing Co., Wis. Associated with the company for the past 32 years, except for service with the War Industries Board in 1917 and 1918, Mr. Grothaus moves to his new post from that of assistant to the president. He has been active in the N.E.M.A.

•

• W. F. YOUNG, vice-president of Lapp Insulator Co., was a visitor to San Francisco and the North Pacific coast, following his attendance at the A.I.E.E. convention in Pasadena.

PRIVATE TELEPHONE SYSTEMS

From Two Telephones to Two Thousand or more-

COMPLETE SYSTEMS from $12 up-

New Business-- New Profits--

for the

electrical merchandiser!

Selling private telephone systems opens up a hitherto unexploited market for dealers in electrical equipment—creates new opportunities for profit! Our new merchandising plan—backed by national advertising—permits electrical wholesalers, dealers and contractors to share in this tremendous potential market on a very attractive basis.

These systems include the well-known Automatic Electric P-A-X (Private Automatic Exchange), Intercom. and Serv-U-Fone Systems —ranging in size from 2 to 2000 telephones, and more—and in price, from $12 up. Write at once for full information.

Automatic Electric Private Telephone Systems are designed for private service. They cannot be connected with the public telephone system.

American Automatic Electric Sales Company

1033 West Van Buren Street, Chicago

Sales Offices at Los Angeles, San Francisco and Seattle

...about the Trade

Panama Lamp and Wuelker Join in Reflector Plant

Wuelker Reflector Manufacturing Co. has been organized by William E. Wuelker and Joseph Thieben for the manufacture exclusively of the Wuelker Flexo-Dome and Adjus-To-Angle reflectors which will be distributed nationally by the Panama Lamp & Commercial Co., of which Mr. Thieben is manager. The new company brings together the inventor and developer of the aluminum adjustable reflectors and a well-known distributor of lamps and lighting equipment. While Mr. Wuelker has developed a large line of lighting reflectors and is patentee to a special diffusion finish of his own design, the new company will confine itself exclusively to the manufacture of the two units which have such universal application.

The Flexo-Dome reflector brings for the first time a completely metal-enclosed assembly for the flexible adjustment and direction of light from a dome reflector permanently connected to the wiring system. The Adjus-To-Angle reflector is an ingenious adaptation of two types of reflector in one, with the lower bowl adjustable in any direction for the placing of the spill light from the reflector wherever desired, while a concentrated beam of light is directed immediately downward upon merchandise. This is accomplished by two reflecting surfaces, one mirrored and permanently in place in respect to the lamp while the other is of a diffusing finish which can be thrown on the back wall or in any direction desired.

The reflectors will be made in San Francisco as formerly, and in announcing the new company, Mr. Thieben pointed out that the price for these reflectors is low and the discounts to wholesaler and contractor are larger than usual. Mr. Wuelker will cover the Pacific Coast, calling on utilities, wholesalers and contractors and render consulting and advisory service, in addition to sales work, from his wide theatrical experience.

•

• GROWTH OF Nesco business in territory surrounding San Francisco has resulted in the appointment of Homer B. Meek, as special representative for products of the National Enameling and Stamping Co., whose Pacific Coast sales are handled by the General Sales Corp. George Foster, who has successfully represented Nesco for 25 years, will continue with other important lines handled by General Sales.

BRASS BUSHED
for greater strength

•

Hemingray Adds to its Long List of Advantages

1. Brass bushed smooth threads for insulator pin.
2. Greater mechanical strength.
3. Sustained high dielectric strength.
4. Unaffected by sudden temperature changes.
5. Withstand maximum insulator pin expansion.
6. Never age or deteriorate.
7. Controlled uniformity of product.
8. All surfaces impervious to moisture.
9. Tougher—withstand rough handling.
10. Clear and flawless for easy inspection.

Owens-Illinois Glass Company, Hemingray Division, Muncie, Ind.

HEMINGRAY Glass INSULATORS

F. B. Connelly Co. Reaches 50-Year Mark

Fifty years of continuous service were recorded last month by F. B. Connelly Co., Northwest household appliance distributors. The firm is the exclusive wholesaler in five Northwestern states for several nationally known lines of electric refrigerators, radios, washers and ironers, ranges and practically all electric household appliances.

From its founding, a half century ago in Billings, Mont., the company has expanded to several hundreds of dealers. On Jan. 1, 1933, it simultaneously opened branches in Portland, Seattle and Spokane. Officers are F. B. Connelly, president; Kenneth Connelly, vice-president and general manager, and W. R. McCurdy, general sales manager.

●

• MODERNIZATION of the downstairs floor of its Granville St. branch in Vancouver, forced the B. C. Electric Railway Co. to remove its bargain basement to the company's bus terminal building at Seymour and Dunsmuir Sts. In announcing the change, the firm advertised a gigantic bargain basement removal sale, and thus was able quickly to dispose of practically all its stock.

●

• PERMISSION TO REORGANIZE the Twin Harbor Electrical Co., Inc., of Seattle, has been asked by officials of the corporation in a financial reorganization plan filed recently in the court of Federal Judge John C. Bowen. The company, which operates transmission lines in Grays Harbor and Pacific counties, petitioned for reorganization as authorized by federal bankruptcy laws. Judge Bowen ordered Paul C. Harper of Seattle, president of the company, to manage its affairs until the final hearing on reorganization scheduled for Aug 8.

●

• NATIONAL Electric Products Corp. of Pittsburgh has acquired the business of Raymond Roth, Inc., New York City. Mr. Roth will remain in charge of engineering, sales and production of Goeller connectors, Charmond terminal blocks and other devices, formerly manufactured by Roth, now by National Electric.

●

• CUTLER-HAMMER, INC., has moved its Los Angeles sales office to 1331 Santa Fe Ave. There the firm will continue to carry a complete stock of C-H standardized motor control, safety switches and electrical specialties. W. G. Tapping is in charge.

• THE COMMERCIAL CREDIT CO., financing firm for appliance manufacturers, public utility companies and electrical retailers, has announced a new revised schedule of terms and maturities available for purchase of electrical appliances. It is called an economy purchase plan and offers a minimum down payment of $2.50 on three-year terms for electric ranges and water heaters. Refrigerators take a minimum down payment of $3 and also have three-year terms. Combinations of two or more of the above appliances on one contract take a minimum down payment of $4 and offer four years to pay. Similar terms are offered on washers, ironers, combinations of washers and ironers, vacuum cleaners, water heaters, dish washers, radios, fans, oil burners, air conditioning equipment, commercial refrigeration and hotel and restaurant equipment. Even installation expense, such as wiring, may be included in the contract, with a maximum for range of $40, water heater $20 and dish washer $20.

●

• THE R. R. "CASEY" JONES ELECTRIC Co., South Pasadena, Calif., has been awarded the electrical contract on the new Pasadena Junior College on a bid of $49,000, one of the largest electrical contracts in Southern California in recent months. The Jones company also has been awarded a contract for the electrical work on an addition to the Pasadena Community Playhouse for $14,000.

●

• SATISFACTION with air conditioning equipment installed last year by the Finance Co. of Nevada and Placer Counties, Calif., on Pacific Gas & Electric Co. lines, led the firm to increase its cooling capacity and to replace oil with electric heating when remodeling its building this year.

●

• WESTERN AIR CONDITIONING CORP., promoting sale of Corozone Portable Air Conditioners, have established offices in the California Western States Life Insurance Bldg., Sacramento.

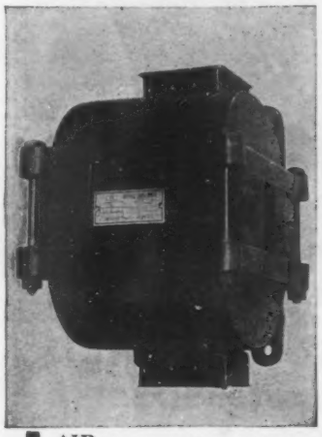
●

• HUGHES & Co., Spokane, has been appointed by the Automatic Washer Co. as distributor for Automatic washers and ironers in territory adjacent to the city.

●

• G. W. FIRTH ELECTRIC is the name of the new Vancouver establishment opened at 1515 West Fifth Ave., by George W. Firth, well known contractor. In addition to enlarging previous services, Mr. Firth has opened a radio service department under management of Harry Matheson.

YOU SAVE



With JEFFRIES

AIR COOLED TRANSFORMERS

● With a Jeffries Air Cooled Transformer money can be saved. The Air Cooled construction lengthens the life of the transformer and lowers repair costs. Plant expansion and extension can be made economically for a Jeffries Transformer provides the voltage change at the point desired without the need of long and expensive conduit runs. Besides a complete line of standard transformers, special designs and voltage furnished to order. Type S. S. Transformer 1 to 5 K. V. A. illustrated.

JEFFRIES TRANSFORMER COMPANY
5706 LONG BEACH AVE., LOS ANGELES

● LOCUST PINS
OAK BRACKETS AND POLE STEPS

Safety
Strength
Lasting Economy

LOCUST PIN CO.
FRONT ROYAL, VA.

Los Angeles — MAYDWELL & HARTZELL INCORPORATED — San Francisco

★ *Electrical Engineers and Manufacturers' Representatives* ★

ROEBLING

PAPER *Insulated* CABLES

We make these cables in both Type H and unshielded constructions, single and multiple conductor, and in a wide variety of voltages.

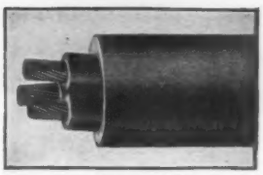
All Roebling Impregnated-paper-insulated cables meet the design, manufacturing, test and guarantee specifications prepared by the High Tension Cable Committee of the Association of Edison Illuminating Companies in consultation with the Insulated Power Cable Engineers Association.

We would be glad to receive your inquiry regarding these cables or any of the many other Roebling Electrical Wires and Cables listed below.

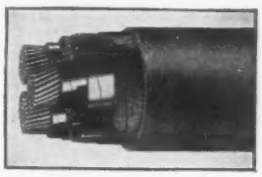
OVER 60 OTHER TYPES

Power Cables: Paper; Cambric; Rubber » Parkway Cable » Tree Wire » Service Cables » Station Cables » Rubber Covered Control Cables » Rubber Covered Wires and Cables: Code; Intermediate; 30% and 40% Performance; 35% and 40% Performite; Plain Rubber 60% Sheath Power Cable and 40% or 60% Sheath Flexible Cords » Slow Burning Wires and Cables » Weatherproof Wires and Cables » Submarine Cables » Portable Cords » And a wide variety of other wires and cables.

JOHN A. ROEBLING'S SONS CO. OF CALIF.
San Francisco • Los Angeles • Seattle • Portland



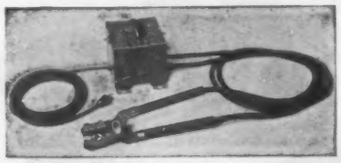
Roebling Rubber Insulated Cable.



Roebling Varnished Cambric Insulated Cable.

ONLY A FINE PRODUCT MAY BEAR THE NAME ROEBLING

...in New Equipment



Hot-Jaw Pliers for Soldering

Capable of a variety of soldering applications, but particularly adaptable to applying or removing solder lugs and to making sweated joints in copper tubes and fittings are the "Thermo-Grip" pliers introduced by the Ideal Commutator Dresser Co. They draw 5 amp. from standard 110-volt, a. c., outlets. A transformer supplies low voltage through cords entering the plier handles. Each plier jaw is a terminal. Thus current flows through the work between two carbon blocks in the jaw ends, and current is consumed only when the pliers are in use. The pliers are of the two-center type, cast in bronze and equipped with fibre tube handles. The entire unit is portable, weighs 14 pounds, and is furnished assembled complete with rubber cord and plug and hi-lo control switch.

●

Toastmaster Styled by Sinel

New Toastmasters, to be advertised in a national campaign breaking Sept. 14, will make their debut in fleet, modern designs by Joseph Sinel, industrial stylist. The fully automatic model, finished in etched, polished chromium, includes a "shock absorber" which eliminates noise when the toast pops up. A two-slice Junior model will make its first appearance. It is announced to retail at $7.50. Illustrated is the de luxe hospitality tray combination, which this year in addition to the new Toastmaster, the cutting board, knife and dishes, includes four lap trays for individual service. Another hospitality tray is offered without the lap trays.

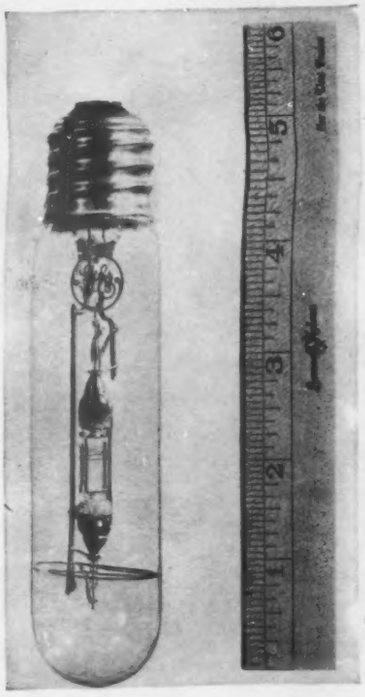
●

Two-Rate Register Watthour Meters

Sangamo Electric Co. has placed on the market a new combination watthour meter, time switch and two-rate register. The time switch will shift the meter register from one dial to the other so that power consumed during off-peak or low-rate periods will be measured as well as energy consumed on the regular rate. The combination is applicable to the standard socket base of the new sequence mounting. Also announced is a combination single-phase watthour meter and time switch, factory mounted to fit the standard socket-type base. The unit is designed expressly for off-peak loads, the time-switch contacts disconnecting the load during the off-peak period by means of internal contacts placed in series with the current-carrying elements of the watthour meter. Time switch and register can be quickly removed from the watthour-meter element, which is so designed that a standard register can be substituted.

Small Standard Mercury Light

An 85-watt mercury vapor lamp, but 5½ inches long and equipped with standard screw base has been introduced commercially by the General Electric Co. Compared to incandescent lamps, it is said to produce thrice the light per watt consumed. Containing no filament, the light source is a tiny column of mercury vapor, less than an inch long, within a quartz tube. This is inclosed in an outer glass bulb. These lamps are available for standard a. c. circuits, a small transformer being required for operation of each lamp. Main applications are expected to be scientific and industrial. Color, although predominantly bluish, contains more red radiation than in other mercury lamps.



●

Porcelain House Wiring Boxes

For greater safety in wiring and for the elimination of grounding hazards, at least two firms have introduced porcelain switch and outlet boxes. These are Porcelain Products, Inc., and Illinois Electric Porcelain Co. Both manufacture the products in standard sizes, with tapped metal inserts for receiving screws of standard covers.

●

Thin-Walled Korduct for Concrete

In announcing Transite Korduct, Johns-Manville culminated several months research in developing a companion product to Transite Conduit. Both are asbestos-cement products, but Korduct, which is thin-walled, was introduced to permit application of Transite qualities to duct systems that are inclosed in concrete. Korduct is claimed to be rot-proof, incombustible, immune to electrolysis and highly resistant to corrosion.

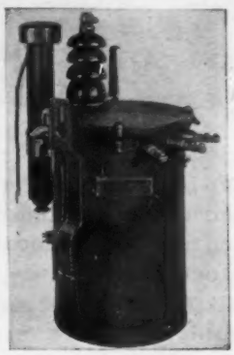
Fluorescent Lights in Color

A new kind of lamp, producing any of the rainbow colors at greatly increased efficiency over present colored lights, has been developed in the laboratories of the Westinghouse Lamp Co. Ultra violet light is produced by a mercury vapor arc within a tube similar to a lumiline. This light is transformed to radiation within the visible spectrum by a fluorescent coating inside the glass. In the picture, Dr. Roy D. Hall, Westinghouse engineer, is pointing to a standard 60-watt green lumiline Mazda lamp. Just above it is a green fluorescent lamp consuming only 15 watts.

●

Rural Service Transformers

Addition to the Allis-Chalmers Manufacturing Co. line are new transformers for rural service, built for commercial voltages in sizes 1½ to 10 kva. inclusive. Said to offer new low copper loss and reactance, the transformers are built with circular high and low voltage coils wound separately. The high voltage winding is on a sectionalized spool and can be slipped off the helical low voltage winding. They are made with either one or two primary bushings, coordinated against surge, and include provisions for mounting surge diverters. They can be furnished for direct bolting to the pole or with conventional hanger hooks.



●

Electrical Attendance Record

An unique electrical method for recording attendance at meetings of luncheon clubs has been developed by two Reno men, members of Kiwanis, and is now offered through a company known as the Attend-a-lite Manufacturing Co. at Reno, Nev. Like a large punchboard the chart provides space for the names of all members for 52 weeks of meetings in the number of holes in the board. By means of a special material on the back of the board, which is opaque to light and which can be removed to indicate attendance, light is permitted to shine through the holes when a member is in attendance.

...in Trade Literature

FINE ART work gives a dramatic twist to a technically informative bulletin published by the Ohio Electrical Manufacturing Co., entitled "Why Ohio Motors Are Reliable." Superfluous material has been weeded from the pages which present in large halftones the essential phases in assuring accuracy of manufacture.

●

HIGH-VOLTAGE power transformers by Allis-Chalmers Manufacturing Co. are illustrated and described in Bulletin No. 1177. Fourteen design features are illustrated and described.

●

WOLVERINE TUBE CO. has revised its bulletin describing its lugs and sleeves. In conjunction, new dealers' price lists are available from R. H. Green, Inc., 1201 24th St., Oakland.

●

PORTABLE CABLE, a General Electric Co. bulletin, has been revised with supplementary material. Principal additions include description and specification of loom-sheath and Glyptal compound types, new shielded designs for high-voltage service on shovels and dredges, and new cable connectors, terminals and couplers.

●

AIR CIRCULATORS by Air Controls Inc., division of The Cleveland Heater Co., are described in Bulletins No. 64, 65, 66 and 67. They are available at 1933 West 114th St., Cleveland, Ohio.

●

UNIVERSAL FUSE LINKS and "Porcelain-Housed Disconnecting Switches" are the titles of two bulletins issued by Schweitzer & Conrad, Inc., Chicago. Information on ratings, dimensions, construction and application are presented for each line.

REFRIGERATION FOR HEALTH is the theme of a booklet published by the Temperature Research Foundation of Kelvinator Corp. Entitled "Scientific Refrigeration in Relation to Nutrition and Health," the publication emphasizes the great value of domestic electrical refrigeration in preserving the healthful qualities of foods, and does much toward routing the fallacious rumors against which electrical refrigeration has defended itself. The author is Lulu G. Graves, honorary president of the American Dietetic Assn., and former chairman of the dietetic section of the American Hospital Assn.

●

EVERDUR ELECTRICAL CONDUIT in a variety of forms and applications is presented in Anaconda Publication E-12 of the American Brass Co., Waterbury, Conn. Everdur is described as a non-sparking, non-magnetic copper-silicon alloy of high ductility, strength, fatigue limit, and corrosion resistance, not subject to selective pitting.

●

THE GRAPHIC, Bulletin No. 436 of the Esterline-Angus Co., Indianapolis, contains many suggestions for cutting losses. It is entitled "How to Make Plant Surveys with Graphic Instruments."

●

GRAYBAR POLE DERRICKS are illustrated and described in a 20-page booklet issued by the manufacturer, the Utility Supply Division of the Four Wheel Drive Auto Co., Clintonville, Wis. All steel truck bodies for line construction and maintenance, together with accessories for both trucks and derricks are also covered. The booklet is available from the manufacturer.

●

BASEBALL LIGHTING, Bulletin No. 2516, is a publication by Crouse-Hinds Co. combining material offered in three preceding bulletins. Complete material bills and instructions for recommended installations are included, together with summary sheets for use by the contractor or distributor in pricing required materials.

THE CONSUMER MARKET DATA HANDBOOK: 1936, has been released by the Bureau of Foreign and Domestic Commerce of the U. S. Department of Commerce. Data include population; retail and wholesale sales; service, amusement and hotel receipts; postal receipts; income tax returns; and wired homes, all classified by cities of more than 2,500 inhabitants as well as segregated according to rural and city locations.

●

METHODS OF MEASURING RADIO NOISE. The Joint Coordination Committee on Radio Reception, consisting of representatives of the Edison Electric Institute, the National Electrical Manufacturers Association and the Radio Manufacturers Association, has produced a report entitled, "*Methods of Measuring Radio Noise*" (NEMA Publication No. 102). The report sets up the instrument specifications for measuring radio noise and the procedure to be followed in the use of such instrument. The text is illustrated by curves and wiring diagrams. Copies may be procured from National Electrical Manufacturers Association, 155 East 44th Street, New York City, at 35c per copy.

●

MODERN THERMOMETRY is given comprehensive coverage in an 88-page catalog, No. 1250, published by The Bristol Co., Waterbury, Conn. Sections deal with liquid-filled, vapor-tension and gas-filled recording, indicating, and controlling thermometers. Data and sketches on both electric and pneumatic temperature controllers and their application are accompanied by more than 500 temperature recording charts, illustrated full size. Printed in engineering reference form, it is aimed to give more complete information on applications of temperature control.

●

ELECTRIFICATION of the Pennsylvania Railroad is completely described in a publication of the General Electric Co. The material is organized in magazine form, carrying illustrations of the locomotives and rail and station equipment.

WHERE TO BUY IT IN THE WEST

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3 Barclay St., New York City — Works: Bethlehem, Pa.

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IDEAL COMMUTATOR DRESSER CO.
1042 Park Ave. Sycamore, Illinois

FOR 38 years, the Type FH breaker has been preferred for station service. It has continually enjoyed this preference because it has continually been improved. Its latest improvements are:

Silver-to-silver main contacts—still further to reduce maintenance.

Improved mechanism—that shortens operating time.

Greater insulation strength—for greater electrical safety.

Remember, too, the opportunity to modernize, to add new parts to your old FH units that will make them *oil-blast* breakers. Ask your G-E representative about the low cost per breaker and the improvements that you get in operation. General Electric Company, Schenectady, N. Y.

890-2

GENERAL ELECTRIC

Where to Buy It in the West—*Continued*

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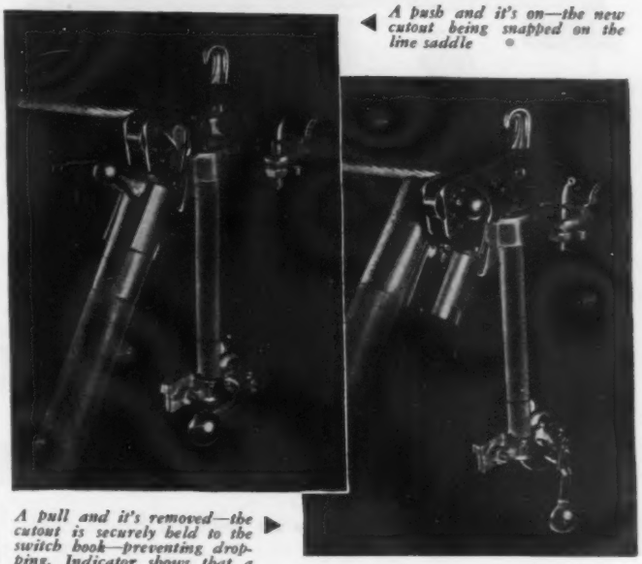
NEW FOR RURAL LINES

The Line Suspension Cutout



◀ *A push and it's on—the new cutout being snapped on the line saddle*

A pull and it's removed—the cutout is securely held to the switch hook—preventing dropping. Indicator shows that a fuse has blown ▶

Low in Cost • Easy to Install and Re-fuse • Universal — Applicable to Any Type of Conductor

Rating: 30 Amperes, 8000/13,800 gr Y Volts

HERE is a new addition to the family of G-E cutouts, with features that provide a high degree of protection for rural lines (particularly 6900-volt) at a cost in keeping with the demand for economical construction.

Four Important Features

Saddle for permanent attachment to the line. It protects the line conductor from being burned when connecting the cutout under load or short-circuit conditions. It is easily attached; hot-line tools are available for use if desired.

Socket. To connect the cutout, simply slip the head of a switch hook or 1¼-inch diam stick in the socket, give it a push, and it's on the line to stay. Socket adjustable for three positions.

Unlatching Hook. To remove the cutout, insert a switch hook in the unlatching hook, where it's held by a spring. Pull the cutout from the saddle—the cutout will stay on the switch hook.

Indicator makes blown fuses easy to spot.

This cutout is built with the full background of General Electric experience in testing and design, using the same high-grade materials that have made the higher-priced G-E fuse cutouts dependable and long-lived. For a complete description, ask for Bulletin GEA-2328. General Electric, Schenectady, N. Y.

340-23N

GENERAL ELECTRIC

They must be

ECONOMICAL

ELECTRICIAN: We want "SA" Series Brushes because they keep our maintenance costs low.

● Operators of electrical equipment watch overall costs—machine maintenance as well as brush cost. They specify "SA" Series Brushes because the five grades, with graduated performance characteristics, permit selection, for every machine, on the basis of good commutation, good brush life and low maintenance expense.

● "SA" Series Brushes are designed, primarily, to meet the severe demands of heavy duty service. This they do, successfully and economically. They also insure economy in the operation of all types of commutating equipment adapted to the use of electro-graphitic grades.

There is a National Pyramid Brush for every class of service

NATIONAL CARBON COMPANY, INC.
CARBON SALES DIVISION, CLEVELAND, OHIO
Unit of Union Carbide UCC and Carbon Corporation
Branch Sales Offices: New York, Pittsburgh, Chicago, San Francisco

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Westinghouse Elec. & Mfg. Co.
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Pelton Water Wheel Co.

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Columbia Steel Co.
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Crucible Steel Co.
General Cable Corp.
Hazard Ins. Wire Works
Keystone Steel & Wire Co.
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OF INTEREST TO ALL GAS AND ELECTRIC APPLIANCE DEALERS IN P·G·and E· TERRITORY

Beginning this month, retail appliance dealers and others who have been receiving our monthly Dealer Bulletin will receive full size advance proofs instead.

Eight days previously required to print and mail the bulletin will thus be saved. This should eliminate the difficulty of tying in with our advertisements scheduled for the first week of the month. Also, it will give you a chance to see our advertisements exactly as they will appear in your paper.

Whenever an important campaign is planned, either by the Gas Appliance Society, the Electric Appliance Society or ourselves, these advance proofs will be preceded by a big, colorful Dealer Bulletin —far superior to anything we could put out on a monthly basis.

When these broadsides arrive you will find them so "meaty," so crammed full of valuable information and money-making ideas that you will want to read them from cover to cover.

We regard this change as a distinct forward step in our dealer relations policy and we hope that it meets with your approval.

P·G·and E·

PACIFIC GAS AND ELECTRIC COMPANY

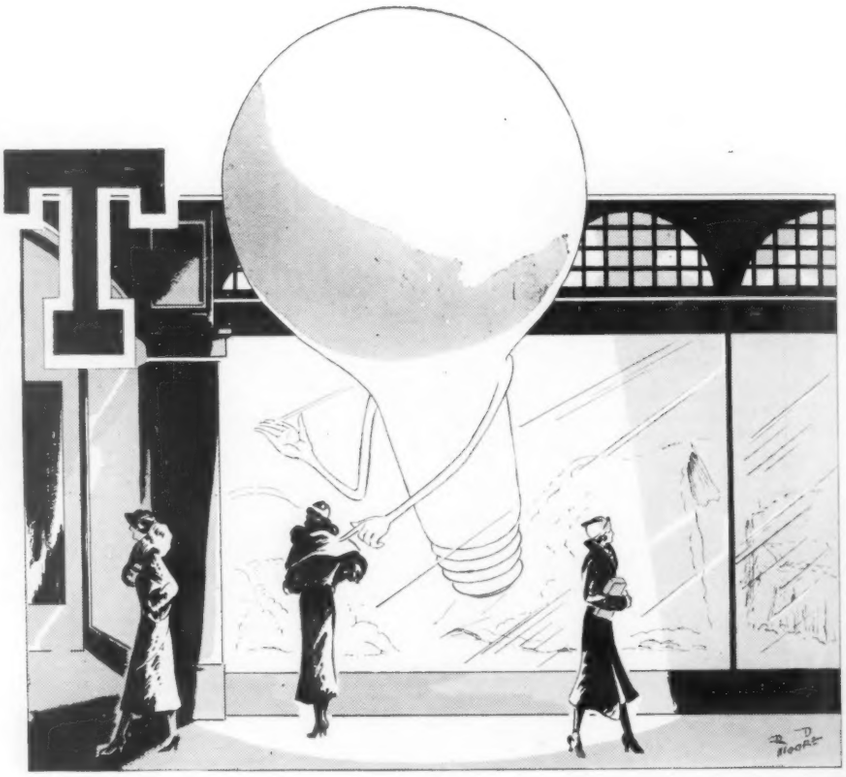
OWNED, OPERATED AND MANAGED BY CALIFORNIANS

EW-108-836

PRINT IN BINDING

LIKE THE ANCIENT MARINER

LIGHT "STOPPETH ONE OF THREE"



TESTS made recently show that in a metropolitan neighborhood district between thirty and thirty-five per cent of the people passing miscellaneous shops on their way to the theatre stopped and looked into those windows that were well lighted.

That's one of the best arguments for good window lighting, and one of the reasons why light is playing a major part in the present wave of commercial building front modernization.

Here's a market ripe for the electrical industry. Consistent promotional advertising and publicity during the past years have made the merchandising world "light conscious" and receptive to the idea of good lighting in a degree never dreamed of a few years ago.

Contractors and dealers, manufacturers of lighting equipment, utilities, can profit greatly by consistently telling and selling the advantages of a well lighted store to the merchants they contact.

Pacific Coast Electrical Bureau

601 West Fifth Street, Los Angeles, California **447 Sutter Street, San Francisco, California**